

Draft Environmental Assessment and Land Protection Plan

*Blackfoot Valley
Wildlife Management Area Expansion*

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Prepared by

U.S. Fish and Wildlife Service
Benton Lake National Wildlife Refuge Complex
922 Bootlegger Trail
Great Falls, MT 594046133
406 / 727 7400

and

U.S. Fish and Wildlife Service
Division of Refuge Planning
P.O. Box 25486 DFC
Denver, CO 80225
303 / 236 4378

In accordance with the National Environmental Policy Act and U.S. Fish and Wildlife Service policy, an environmental assessment and land protection plan have been prepared to analyze the effects of expanding the Blackfoot Valley Wildlife Management Area in western Montana.

- The environmental assessment analyzes the environmental effects of expanding the project boundary of the Blackfoot Valley Wildlife Management Area.
- The Blackfoot Valley Wildlife Management Area Expansion Land Protection Plan describes the priorities for acquiring an additional 80,000 acres in conservation easements within an expanded project boundary of 824,024 acres. Both documents, which stand alone, are contained within this volume.

Note: Information contained in the maps within these documents is approximate and does not represent a legal survey. Ownership information may not be complete.

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Abbreviations

BMU	bear management units
CoCE	Crown of the Continent Ecosystem
DNRC	(Montana) Department of Natural Resources and Conservation
EA	environmental assessment
FONSI	finding of no significant impact
FTE	full-time equivalent
GNLCC	Great Northern Landscape Conservation Cooperative
GNP	Glacier National Park
GPS	global positioning system
HAPET	Habitat and Population Evaluation Team
LCC	landscape conservation cooperative
LPP	land protection plan
LWCF	Land and Water Conservation Fund
MFIS	Montana Fisheries Information System
MFWP	Montana Department of Fish, Wildlife and Parks
MTNHP	Montana Natural Heritage Program
NCDE	Northern Continental Divide Ecosystem
NEPA	National Environmental Protection Act
NHPA	National Environmental Protection Act
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
PCTC	Plum Creek Timber Company
PFW	Partners for Fish and Wildlife
PIF	Partners in Flight
RU	Recovery Unit
Service	U.S. Fish and Wildlife Service
SHC	strategic habitat conservation
SWAP	Small Wetlands Acquisition Program
TNC	The Nature Conservancy
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Area
WPA	Waterfowl Production Area

1 Purpose of and Need for Action



Sandhill cranes in forest opening.

The Blackfoot Valley Wildlife Management Area (WMA) is one of the last undeveloped, low elevation river valley ecosystems in western Montana. It is part of the Crown of the Continent ecosystem (CoCE), which includes the larger Columbia Basin and Upper Missouri/Yellowstone rivers watersheds (see figure 1).

Within the CoCE, an exceptional diversity of wetland types occurs including: major riparian areas, smaller riparian tributaries, glacial prairie potholes, lakes, bogs, fens, swamps, and boreal peat lands. The lowlands support over 170 different species of wetland plants.

In the Blackfoot Valley, wetland densities exceed 100 basins per square mile. The project area includes over 34,000 miles of rivers, creeks, and streams. Along the elevation gradient, large expanses of fescue grasslands phase into alpine meadows or sagebrush steppe, which then transition into montane forests consisting of white pine, Douglas-fir, and ponderosa pine. These transitional zones of valley floors to montane forests are extremely important to fish and wildlife.

The continued presence of this large expanse of intact habitat and historic wildlife corridors would benefit federal trust species such as grizzly bear, gray wolf, wolverine, pine martin, and Canada lynx; migratory birds such as harlequin ducks, red-necked grebes, Brewer's sparrow, black tern, olive-sided flycatcher, peregrine falcons, greater sandhill cranes,

and trumpeter swans; and fish such as bull trout. The Blackfoot Valley WMA provides excellent habitat for black bear, elk, mule deer, white-tailed deer, moose, mountain lion, bobcat, coyote, wolverine, fisher, and a wide variety of small mammals.

PROPOSAL

The Blackfoot Valley WMA easement program is a landscape conservation strategy to protect one of the last undeveloped, low elevation river valley ecosystems in western Montana (see figure 2). The U.S. Fish and Wildlife Service (Service) proposes to expand the existing boundary of the Blackfoot Valley Wildlife Management Area from 165,000 acres to 824,024 (see appendix A, list of preparers and reviewers). The Blackfoot Valley provides a vital habitat corridor between existing U.S. Forest Service boundaries, Bureau of Land Management properties, state wildlife management areas, Service waterfowl production areas, Nature Conservancy easements, Service conservation easements, and Partners for Fish and Wildlife (PFW) projects. A protection program based on obtaining conservation easements was started for the Blackfoot Valley in 1994, and it has experienced a great deal of support and success, and there is new opportunity in the Blackfoot River Valley for easements that lie outside of the existing boundary. The proposed expansion involves the acquisition of an additional 80,000 acres of conservation easements from willing sellers on private land within the watershed. The program



Figure 1. Crown of the Continent ecosystem.

also continues to complement other components of a broad partnership known as the “Blackfoot Challenge.”

PROJECT AREA

The Blackfoot Valley WMA project area encompasses an 824,024-acre ecosystem that includes portions of Missoula, Powell, and Lewis and Clark counties (see figure 2). The parts of these counties make up the Blackfoot River watershed in western Montana. The watershed is bordered to the east by the Continental Divide, to the south by the Garnet Mountains, to the north by the Bob Marshall and Lincoln-Sagegoat Wilderness Areas, and to the west by the Rattlesnake Wilderness Area.

The watershed is located at the southern edge of the CoCE, a 10-million-acre area of the Northern Rocky Mountains that extends north into Canada and includes Waterton-Glacier International Peace Park, Canada’s Castle Wilderness, the Bob Marshall-Great Bear-Sagegoat Wilderness Complex, parts of the Flathead and Blackfoot Indian Reservations, Bureau of Land Management lands and significant acreage of state and private lands. The watershed provides critical connections between the CoCE and the Selway/Bitterroot Ecosystem to the south. The center of the project area lies about 55 miles east of Missoula.

DECISIONS TO BE MADE

Based on the analysis in this environmental assessment (EA), the Service’s director of region 6, with the concurrence of the director of the U.S. Fish and Wildlife Service, will make three decisions:

- Determine whether the Service should expand the existing boundary of the Blackfoot Valley Wildlife Management Area.
- If yes, select an approved, conservation-easement project boundary that best fulfills the habitat protection purposes.
- If yes, determine whether the selected alternative would have a significant impact on the quality of the human environment. The National Environmental Policy Act (NEPA) of 1969 requires this decision. If the quality of the human environment would not be significantly affected, a finding of no significant impact (FONSI) will be signed and made available to the public. If the alternative would have a significant impact, completion of an environmental impact statement would be required to address further those impacts.

ISSUES IDENTIFIED AND SELECTED FOR ANALYSIS

An open house public meeting was held in Ovando, Montana May 19, 2010. Public comments were taken to identify issues to be analyzed for the proposed project. Approximately seventeen landowners, citizens, and elected representatives attended the meetings and all expressed positive support for the project. Following the open house meeting, factsheet and flyers were posted in the Benton Lake National Wildlife Refuge (NWR) Complex headquarter’s visitor center notifying visitors of the proposed project. Twelve letters providing comments and identifying issues and concerns were also submitted.

In addition, the Service’s field staff has contacted local government officials, other public agencies, and conservation groups, which have expressed an interest in and a desire to provide a sustainable future for the Blackfoot Valley WMA. Factsheet flyers were distributed at the public meeting, and project information was also made available on the refuge and regional planning websites.

Many of the comments received addressed the need for a balance between natural and cultural systems. There are two main categories of commonly expressed issues and concerns.

BIOLOGICAL ISSUES

- The impacts of habitat fragmentation due to residential development.

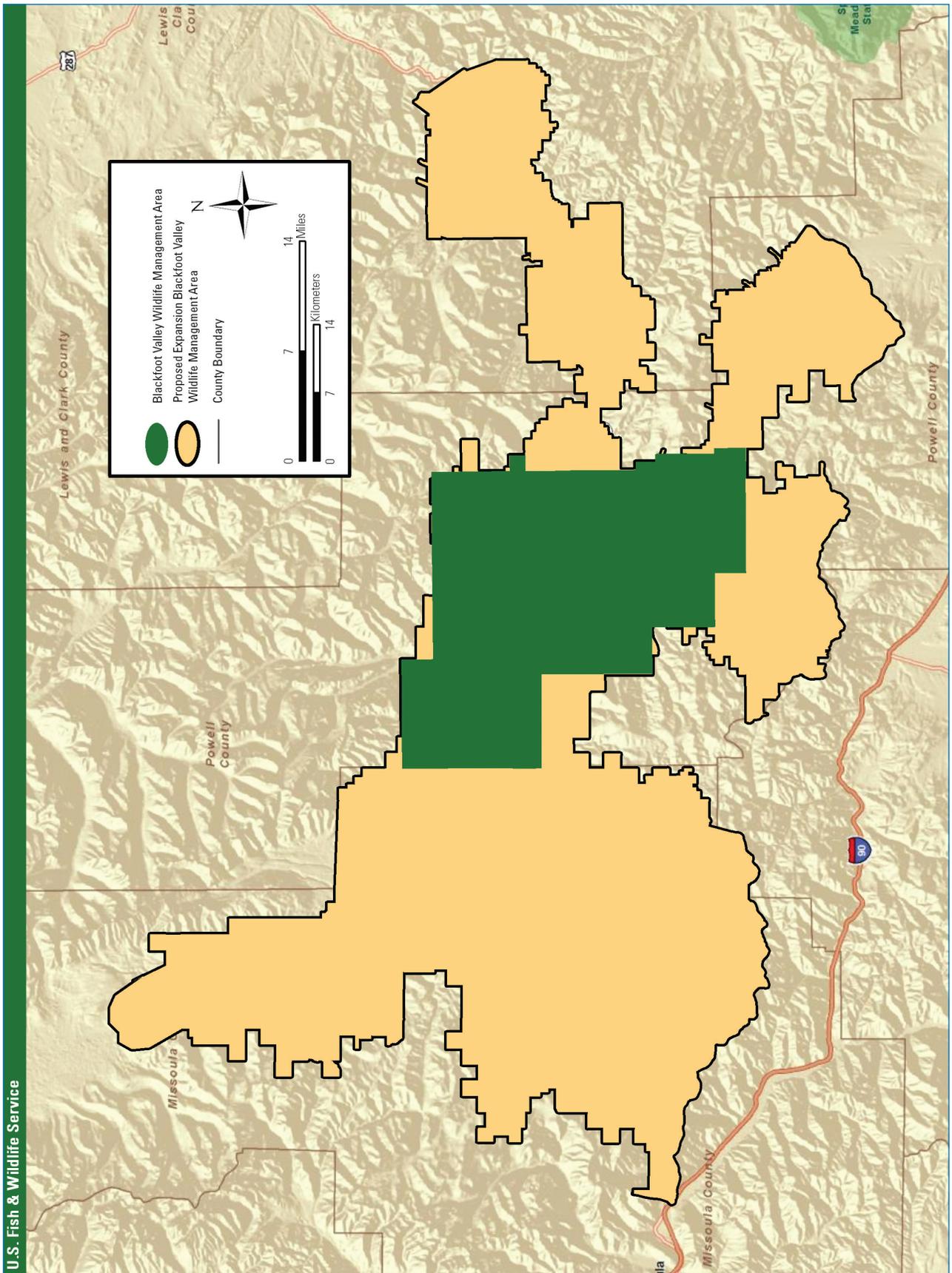


Figure 2. Blackfoot Valley Wildlife Management Area expansion project area.

- Concerns about the effect of habitat fragmentation on wildlife habitat and water resources.

Wildlife Habitat

Habitat fragmentation is a concern not only in the Blackfoot Valley, but also in other areas of Montana. Given the current strong market for scenic western properties, especially when cattle prices are low, there is concern that ranches in the Blackfoot Valley will be vulnerable to sale and subdivision for residential and commercial development.

Housing development, and the associated infrastructure, can disrupt wildlife migration patterns. Nesting raptors and grassland bird species may be especially vulnerable to habitat fragmentation in the Blackfoot Valley.

Riparian habitat loss due to development is a key concern. Riparian habitat is a key component to grizzly bear movement between the mountains and valley. Livestock grazing and ranching practices tend to be compatible with grizzly bears, which move unimpeded up and down riparian corridors. Riparian areas also provide nest sites for many species of migratory birds that may be negatively impacted by development.

Water Resources

Residential development in the Blackfoot Valley presents a potentially significant threat to the aquatic ecosystem. Housing developments can bring about sewage-derived nutrient additions to streams and lakes, additional wetland drainage, water diversion and introduction of invasive species.

SOCIOECONOMIC ISSUES

- the need to keep private land in private ownership
- the impacts of conservation easements on local community centers and their ability to grow
- public access for hunting or other recreational opportunities

Landownership and Land Use

There is concern that perpetual easements would negatively affect future generations of landowners. A concern is that conservation easements would limit the choices of future landowners, even though they may have paid as much for the land as if it had no restrictions. There are concerns that perpetual easements would lower the resale value of the land.

There is concern that the selection process would favor landowners whose properties are larger in size over smaller but biologically valuable properties.

Concern also exists over 'boxing in' rural communities which could limit the opportunity for development. Suggestions included the placement of a no easement buffer around rural communities to ensure potential growth.

Public Use

The public's right to use or access lands encumbered with a conservation easement is a concern. Landowners are concerned they would be forced to allow the public to access their land for hunting, fishing, or other recreational uses.

ISSUES NOT SELECTED FOR DETAILED ANALYSIS

There were two issues that were not analyzed in this EA.

Property Tax

Historically, there has been concern about the amount of tax generated to the counties when land protection programs take place. Since the proposed project is a conservation easement program, the land enrolled in the program does not change hands and, therefore, the property taxes paid by the landowner to the county are not affected.

Development of rural landscapes often leads to increased demand for services and higher costs to rural counties. There would generally be an offset of any perceived reduction in the tax base since the county would not incur the expense of providing services to rural developments. The use of conservation easements serves an additional function since easements preclude the necessity for county zoning in the project area.

Nomenclature

During the scoping for this project, it became apparent the name 'Blackfoot Valley Wildlife Management Area' causes confusion among the public, local agencies, and organizations. Montana Fish, Wildlife and Parks commonly uses the term 'wildlife management area' to designate wildlife areas that are managed by the state. When both the Service and MFWP use this term, many people are confused about which agency is responsible for managing the area.

The naming of National Wildlife Refuge System (NWRS) units is an internal administrative action, and does not require an environmental analysis under NEPA. As such, the planning team will pursue a name change for this unit in a separate process from this EA and land protection plan (LPP). The team will recommend the new name for this unit to be the 'Blackfoot Valley Conservation Area' which is consistent with other easement programs in the NWRS.

NATIONAL WILDLIFE REFUGE SYSTEM AND AUTHORITIES

The mission of the National Wildlife Refuge System is to preserve a national network of lands and waters for the conservation, management and, where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. The Blackfoot Valley WMA would be managed as part of the Refuge System in accordance with the National Wildlife Refuge System Administration Act of 1966 and other relevant legislation, executive orders, regulations, policies, and management plans such as:

- Land and Water Conservation Fund Act (1965)
- Migratory Bird Treaty Act (1918)
- Endangered Species Act (1973)
- Bald Eagle Protection Act (1940)
- Migratory Non-game Birds of Management Concern in the U.S. (2002)
- U.S. Fish and Wildlife Act (1956)
- North American Waterfowl Management Plan (1994)

RELATED ACTIONS AND ACTIVITIES

Landownership in the watershed is 54% federal (U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management), 10% state (Department of Natural Resources and Conservation, Montana Fish, Wildlife and Parks, and University of Montana), 31% private, and 5% by corporate timber company (Plum Creek Timber Company). Most of the middle and high elevation forested lands within the watershed are administered by the U.S. Forest Service (USFS). Private lands are concentrated in the low elevation portions of the watershed. Landownership patterns in the watershed have changed in recent years due to large-scale transfers of Plum Creek Timber Company (PCTC) lands.

In 2002, the Blackfoot Challenge initiated a three-phase landscape-level effort to protect, restore, and enhance 37,000 acres of biologically significant wetlands (5,310 acres) and associated uplands (31,690 acres) for migratory birds and other wildlife species by 2015. The Blackfoot Watershed I, Montana Project was completed in 2007, resulting in protection, restoration, and enhancement of a total of 16,794 acres (3,027 acres of wetland and 13,767 acres of associated upland). The Blackfoot Watershed II, Montana Project is in process.

In 2003, the Blackfoot Challenge and The Nature Conservancy (TNC) initiated the Blackfoot Community Project, which involved the purchase and re-sale of 89,215 acres of PCTC lands based on a community-driven disposition plan. The lands

encompassed all PCTC lands from the Blackfoot River headwaters near Rogers Pass to the Clearwater drainage. Approximately 75% of the lands have been or will be transferred into federal or state ownership and 25% into private ownership.

In 2008, the Nature Conservancy and the Trust for Public Land entered into another agreement with PCTC called the Montana Legacy Project, to purchase 312,500 acres of timberland in western Montana. As part of the Legacy Project, a total of 71,754 acres in the Clearwater and Potomac valleys of the watershed will be purchased and resold to public agencies and/or private buyers. The majority of these lands are intended to be re-sold to the USFS and Montana Department of Natural Resources and Conservation (DNRC).

In 2009, the Blackfoot Challenge and Trout Unlimited prepared a Blackfoot Sub-basin Plan for the Northwest Power and Conservation Council. The vision for the Blackfoot Sub-basin is for a place characterized by dynamic natural processes that create and sustain diverse and resilient communities of native fish and wildlife and the aquatic and terrestrial habitats on which they depend, thereby assuring substantial ecological, economic, and cultural benefits. The efforts to conserve and enhance those natural resources will be implemented through a cooperative partnership between public and private interests that will seek to sustain not only those natural resources, but the rural way of life of the Blackfoot River Valley for present and future generations (Blackfoot Challenge and Trout Unlimited 2009). Expansion of the Service's easement program boundary supports and complements this vision.

HABITAT PROTECTION AND THE EASEMENT ACQUISITION PROCESS

On approval of an expanded project boundary, habitat protection would occur through the purchase of conservation easements. It is the long-established policy of the Service to acquire minimum interest in land from willing sellers to achieve habitat acquisition goals.

The acquisition authority for the proposed action is the Fish and Wildlife Act of 1956 (16 U.S.C. 742 a-742j). The federal money used to acquire conservation easements from the Land and Water Conservation Fund (LWCF) are derived primarily from oil and gas leases on the outer continental shelf, motorboat fuel tax revenues, and sale of surplus federal property. There could be additional funds to acquire lands, waters, or interest therein for fish and wildlife conservation purposes through congressional appropriations, the Migratory Bird Conservation Fund, the North American Waterfowl Conservation Act funds, and donations from non profit organizations.

The basic considerations in acquiring an easement interest in private land are the biological significance of the area, existing and anticipated threats to wildlife resources, and landowner interest in the program. The purchase of conservation easements would occur with willing sellers only and would be subject to available funding.

2 Alternatives

This chapter describes the two alternatives identified for this project:

- no-action alternative
- proposed action, giving the Service the authority to expand the boundary of the Blackfoot Valley Wildlife Management Area

The alternatives consider the effects of a conservation program within the boundaries identified for the project area in this EA.

ALTERNATIVE A (NO ACTION)

The Service started a conservation easement program in the Blackfoot Valley in 1994. Conservation easements are currently available through the Small Wetlands Acquisition Program (SWAP) and the Land and Water Conservation Fund. The current project boundary is 165,000 acres with a goal of acquiring easements on 23,500 acres within the project boundary.

To date, the Service has acquired approximately 20,000 acres of easements within the current project boundary. The Service would continue to secure conservation easements on the remaining 3,500 acres of the acquisition goal. When the 23,500 easement acre goal is reached, no new easements would be acquired with LWCF money.

Alternative A assumes the management of habitat benefiting migratory birds and other wildlife will remain at current levels. Enhancement or restoration projects on private land such as water development, grazing systems, and grassland management would continue through cooperative efforts with private landowners. There will be no effort made to expand current conservation areas.

Private efforts by land trusts would continue to secure conservation easements.

ALTERNATIVE B (PROPOSED ACTION)

The Blackfoot Valley WMA is a landscape conservation strategy to protect one of the last undeveloped, low elevation river valley ecosystems in western Montana. The Service proposes to expand the existing boundary of the Blackfoot Valley Wildlife Management Area from 165,000 acres to approximately 824,024, and to acquire an additional 80,000 acres within that project boundary. The project

area provides a vital habitat corridor between existing U.S. Forest Service boundaries, Bureau of Land Management properties, state wildlife management areas, Service waterfowl production areas, Nature Conservancy easements, Service conservation easements, and Partners for Fish and Wildlife projects.

The Service would seek to purchase conservation easements from willing sellers on privately owned land. Conservation easement contracts would specify perpetual protection of habitat for trust species and restrict development.

Prioritization of areas considered for conservation easements within the project areas would be based on the biological needs of the wildlife species of concern (migratory birds and threatened and endangered species), the threat of development, connectivity with other protected lands, and quality of habitat types (including riparian areas, wetlands, and native grasslands) for trust species. The Service generally focuses on parcels >160 acres, however parcels <160 acres may be considered for conservation easements if unique biological values exist. The land protection plan describes these priorities in detail.

The easement program would rely on voluntary participation from landowners. Grazing would not be restricted on the land included in the easement contract.



Marbled godwit.

Development for residential, and commercial or industrial purposes, such as energy and aggregate extraction would not be permitted on properties under a conservation easement. Alteration of the natural topography, conversion of native grassland to cropland, drainage of wetlands, and establishment of game farms would also be prohibited.

No fee-title acquisition will occur. Conservation easement lands would remain in private ownership; property tax and land management would remain the responsibility of the landowner. Control of public access to the land would remain under the control of the landowner.

The easement program would be managed by the Benton Lake NWR Complex staff headquartered in Great Falls, Montana. The Benton Lake NWR Complex staff would be responsible for monitoring

and administration of all easements on private land. Monitoring would consist of periodically reviewing land status in meetings with the landowners or land managers to ensure that the stipulations of the conservation easement are being met. Photo documentation would be used at the time the easements are established to document baseline conditions. An estimated 1.67 full-time equivalent (FTE) employees would be hired at an average salary of \$54,911 per employee under this management alternative.

ALTERNATIVES CONSIDERED BUT NOT STUDIED

No other alternatives were considered.

3 Affected Environment

This chapter describes the biological, cultural, and socioeconomic resources most likely affected by expanding the Blackfoot Valley Wildlife Management Area.

BIOLOGICAL ENVIRONMENT

The biological environment studied included climate, geological resources, habitat, and wildlife.

CLIMATE

The climate is generally cool and dry, but there is considerable variability corresponding to the east-west elevational gradient that greatly influences vegetation and habitat. The average maximum temperature is 54°F with the coldest minimum temperatures in January (5°F). July and August are the warmest months with an average high around 81°F and a low near 40°F. On average, the warmest month is July. The highest recorded temperature was 99°F in 2003. January is the average coolest month. The lowest recorded temperature was -48°F in 1982.

The Blackfoot Valley receives between 12 and 16 inches annual precipitation, while western parts of the Flathead/Mission Valley tend to be drier. The Ovando area receives 17 inches average annual precipitation, with average annual snowfall of 79 inches.

GEOLOGICAL RESOURCES

Glaciation strongly influenced the current watershed landscape as evidenced by numerous moraines and associated hummocky topography, glacial pothole lakes and broad expanses of flat glacial outwash (Whipple et al. 1987, Cox et al. 1998). The watershed was subjected to two major periods of glaciation, the Bull Lake glaciation (~70,000 years ago) and the Pinedale glaciation (~15,000 years ago). During these periods, large continuous ice sheets extended from the mountains southward into the Blackfoot and Clearwater River Valleys (Witkind and Weber 1982). During the latter part of the Pleistocene Era, the Blackfoot Valley was further shaped by the repeated filling and catastrophic draining of Glacial Lake Missoula, a massive lake formed by a series of ice dams that impounded the Clark Fork River downstream of Missoula. In the Blackfoot Valley, Glacial Lake Missoula extended upstream as far as Clearwater Junction (Alt and Hyndman 1986).

When the glaciers receded, large deposits of glacial till, glacial outwash, and glacial lakebed sediments were left behind. These deposits cover much of the Blackfoot Valley floor, shaping the topography of the valley and the geomorphology of the Blackfoot River and the lower reaches of most tributaries. Glacial features evident on the landscape today include moraines, outwash plains, kame terraces and glacial potholes. The landscape between Clearwater Junction and Lincoln, for example, is characterized by alternating areas of glacial moraines and their associated outwash plains. In this area, ice pouring down from the mountains to the north spread out to form large ponds of ice several miles across known as piedmont glaciers. Muddy melt water draining from these piedmont glaciers spread sand and gravel across the ice-free parts of the valley floor to create large outwash plains. The town of Ovando sits on one of these smooth outwash plains (Alt and Hyndman 1986).

HABITAT

Geologic, hydrologic, and geographic features in the Blackfoot River watershed combine to produce a diversity of vegetation communities including prairie grasslands, sagebrush steppe, coniferous forest, and extensive wetland and riparian areas. Over 80% of the watershed is covered with mixed species conifer forests dominated by ponderosa pine, lodgepole pine, Douglas-fir, and western larch at the lower elevations, and subalpine-fir and spruce in the higher regions, especially on cool, moist, northerly aspects. The remaining portions of the watershed consist of native bunchgrass prairie (10%), agricultural lands (5%), and a combination of shrub lands, wetlands, lakes, and streams (5%). Less than 1% of the watershed is developed (Blackfoot Challenge 2005). The greatest source of biological diversity in the watershed arises from wetland features such as glacial lakes, vernal ponds, fens, basin-fed creeks, spring creeks, marshes, and riparian areas (USFWS 2009a). Lesica (1994) estimates that 600 vascular plant species occur within the watershed of which nearly 30% are associated with wetlands. The Blackfoot River watershed supports a number of rare plant communities. The three-tip sagebrush/rough fescue plant association is common in the Ovando area, yet found nowhere else in the world. The big sagebrush/rough fescue plant association, endemic to west- and north-central Montana, is common in the Kleinschmidt Flat area. Expanses

of the Drummond's willow plant association occur in riparian swamps along Monture Creek and mud sedge, sharp bulrush, mannagrass, and fen peat land plant communities are unique to the area's glacial pothole wetlands (USFWS 2009a, MTNHP 2009b). According to Montana Partners in Flight (PIF 2000), the watershed contains all of the highest priority habitats for bird conservation in Montana. These habitats include mixed grassland, sagebrush steppe, dry (ponderosa pine/Douglas-fir) forest, riparian deciduous forest, and prairie pothole wetlands. The watershed also contains four of the seven community types in greatest need of conservation, according to Montana's Comprehensive Fish and Wildlife Conservation Strategy (MFWP 2005). These include grassland complexes, mixed shrub/grass associations, riparian, and wetland communities and mountain streams.

WILDLIFE

The Blackfoot River watershed is one of the most biologically diverse and intact landscapes in the western United States. The watershed supports an estimated 250 species of birds, 63 species of mammals, 5 species of amphibians, 6 species of reptiles, and 25 species of fish (MTNHP 2009a)(See appendix B).

Mammals

Because of its rural and largely intact nature, the watershed retains the full complement of large mammals, many of which have been extirpated from portions of their historic ranges. The Blackfoot River watershed provides excellent habitat for grizzly bear, black bear, elk, mule deer, white-tailed deer, mountain lion, Canada lynx, bobcat, gray wolf, coyote, wolverine, fisher and a wide variety of small mammals.

Amphibians and Reptiles

There are currently six reptile species in the Blackfoot Valley including common garter snake, eastern racer, northern alligator lizard, painted turtle, rubber boa, and terrestrial garter snake. (MTNHP 2009a)

There are currently five amphibians that have been documented in the Blackfoot Valley including Columba spotted frog, long-toes salamander, Pacific tree frog, Rocky Mountain tailed frog, and western toad.

Fish

There are currently twelve native fish species and thirteen non-native fish species in the Blackfoot Valley watershed, as well as several hybrid salmonids (MFIS 2009).



Garter snake.

USFWS

Migratory and Other Birds

The Blackfoot River watershed also provides high quality breeding, nesting, migratory, and wintering habitat for a diversity of bird species. Wetland complexes in the watershed provide important breeding habitat for 21 species of waterfowl: northern pintail, mallard, lesser scaup, wood duck, redhead, ring-necked duck, canvasback, American wigeon, Canada goose, green-winged teal, blue-winged teal, cinnamon teal, northern shoveler, gadwall, common goldeneye, Barrow's goldeneye, harlequin duck, bufflehead, hooded merganser, common merganser, red-breasted merganser, and ruddy duck.

During the nesting season in 1995, 1996, and 1997, the University of Montana Wildlife Cooperative Unit and the Service conducted breeding-bird productivity studies in three separate properties within the Blackfoot watershed including the Blackfoot Waterfowl Production Area. Mayfield nest success for upland nesting waterfowl, including pintail, mallard, and lesser scaup, was found to be 49, 30, and 45 percent, respectively (Fondell and Ball 1997). These nest success estimates are some of the highest in North America for upland nesting ducks. Fondell and Ball (1997) stated that "Because the [Ovando] Valley is relatively undisturbed these estimates may reflect nest success over large areas of the watershed."

Brood surveys of northern shoveler, gadwall, American wigeon, cinnamon and blue-winged teal, canvasback, redhead, ring-necked, ruddy, and Barrow's goldeneye ducks in 1995 and 1996 on the Blackfoot Valley Waterfowl Production Area (WPA) averaged sixty-three broods on five wetlands totaling 104 acres, or 0.62 broods/acre, with pre-fledge brood sizes of 5.2 in 1995, and 5.9 in 1996, higher than brood sizes reported in studies conducted at Freezeout Lake Wildlife Management Area and at Benton Lake National Wildlife Refuge on the east side of the Continental Divide (Fondell and Ball 1997). This high productivity is due to the large expanses of relatively undisturbed native grassland in association with wetland habitat, a coyote-dominated predator base, and high concentration of glaciated wetlands.

Breeding waterfowl pair counts have indicated relatively high pair densities per square section for redhead and canvasback ducks. Redhead duck numbers over the past 15 years have averaged twelve pairs per section and canvasback ducks at nine pairs per section.

Species of Special Concern

According to the Montana Natural Heritage Program database (MTNHP 2009a) there are forty-one animal species of concern in the Blackfoot River watershed. These include invertebrates, birds, fish, mammals, reptiles, and amphibians. Eight of the fourteen bird species ranked by Montana Partners in Flight (PIF 2000) as Level I priority species in the state are found in the watershed: common loon, trumpeter swan, harlequin duck, Columbian sharp-tailed grouse, black-backed woodpecker, flammulated owl, olive-sided flycatcher, and brown creeper (see appendix C).

Black terns are considered a species of special concern by the Service in Region 6 and on the Montana Priority Bird Species List, they are listed at a Level II which dictates that Montana has a high responsibility to monitor the status of this species, and design conservation actions. The Blackfoot River watershed hosts the largest black tern colony documented in Montana.

The Blackfoot River watershed supports western Montana's largest population of Brewer's sparrow, one of the highest priority songbirds in Montana (Casey 2000). This sagebrush obligate was the most abundant breeding species found at sagebrush sites on the Blackfoot and Kleinschmidt Waterfowl Protection Areas during Service productivity surveys in 1996 (Fondell and Ball 1997). The long-term viability of Brewer's sparrows in Montana will depend on the maintenance of large stands of sagebrush in robust condition (PIF 2000).

The watershed is perhaps also the best breeding and nesting area for the long-billed curlew in western Montana. This species is declining nationally and has been identified as a priority in both the shorebird and partners in flight conservation plans. Local surveys on Kleinschmidt Flat in 1997 found thirty-one pairs

on 3,840 acres, or >8 pairs per 1,000 acres. Production was not monitored, but many broods were noted. This species is highly reliant on grassland nesting habitat, and will also nest in sagebrush steppe, and relies more heavily on wetlands during migration. Small population size and negative population trends, combined with threats of habitat degradation on both breeding and wintering grounds, make the long-billed curlew a high conservation priority (National Audubon Society 2007).

Federally listed animal species found in the Blackfoot River watershed include the threatened bull trout, grizzly bear, and Canada lynx. The gray wolf, which was delisted from endangered status in March 2009, the bald eagle, which was delisted from threatened status in July 2007, and the fisher, which is a candidate for listing, also occur in the watershed (USFWS 2009c). The relationship of the watershed to Endangered Species Act planning units is as follows:

Bull Trout

For listing purposes, the Service divided the range of bull trout into distinct population segments and twenty-seven recovery units. The Blackfoot River watershed lies within the Clark Fork River Recovery Unit and the Upper Clark Fork Recovery Subunit. Within this subunit, the watershed has been identified as a core recovery area (USFWS 2002). The watershed has been proposed as critical habitat within the Clark Fork River drainage (USFWS 2010).

Within the watershed, bull trout densities are very low in the upper Blackfoot River, but increase downstream of the North Fork. Streams that appear to be particularly important for the spawning of migratory bull trout include Monture Creek, the North Fork Blackfoot River, Copper Creek, Gold Creek, Dunham Creek, Morrell Creek, the West Fork Clearwater River, and the East Fork Clearwater River. Bull trout spawner abundance is indexed by the number of identifiable female bull trout nesting areas (redds). Data indicate that Monture Creek has an upward trend from ten redds in 1989 to an average of fifty-one redds in subsequent years (Pierce et al. 2008). The North Fork also shows an upward trend from eight redds in 1989 to an average of fifty-eight redds between 1989 and 2008. The Copper Creek drainage (including Snowbank Creek) has experienced a resurgence of bull trout redds— from eighteen in 2003 to 117 in 2008—since the 2003 Snow Talon Fire. The total number of redds counted in these three streams (Monture Creek, North Fork, and Copper Creek) increased from thirty-nine in 1989 to 217 in 2000. With the onset of drought, bull trout redd counts then declined to 147 in 2008. These changes are attributed to protective regulations first enacted in 1990, restoration actions in spawning streams during the 1990s and a period of sustained drought between 2000 and the present (Pierce et al. 2008).



Mike Parker/USFWS

Long-billed curlew.

Grizzly Bear

Grizzly bears are currently listed as a federally threatened species in the Northern Continental Divide Ecosystem (NCDE)(USFWS 2009c). Many scientists recognize the grizzly bear as an ‘umbrella species,’ as the preservation and management of good-quality grizzly bear habitat will benefit many wildlife resources and plants. Grizzly bears require large amounts of land to roam in search of food and mates. The population numbers of grizzly bears are a publicly and scientifically recognized indicator of the health of many ecosystems. The NCDE is an area of the northern Rocky Mountains with large blocks of protected public land containing some of the most pristine and intact environments found in the contiguous United States. The NCDE supports the largest population of grizzly bears in the lower 48 states. Despite dramatic losses of habitat throughout North America, the grizzly bear has maintained a presence in Montana and occurs in portions of the watershed. The watershed is the southern boundary for the NCDE grizzly bear recovery zone. The Grizzly Bear Recovery Plan (USFWS 1993) includes most of the watershed as suitable and/or occupied habitat.

The U.S. Geological Survey (USGS) Northern Divide Grizzly Bear Project, designed to estimate population size and distribution, confirmed the presence of twenty-nine individual grizzly bears in the Blackfoot River watershed in 2003 and 2004. The USGS estimates that at least forty bears are present during all or part of the year in the watershed (USGS 2004). In recent years, grizzly bear activity has increased in the watershed. This area appears to be an important habitat link for grizzly bears that are re-colonizing historical ranges to the south. Maintaining habitat connectivity is critical to sustaining grizzly bear life histories and maintaining sustainable subpopulations within the southern portion of the Northern Continental Divide Ecosystem.

Grizzly bears breed, forage, and migrate throughout the watershed and den above 6,500 feet. They move from high mountain elevations to lower valley bottoms to forage seasonally for available food. Lakes, ponds, fens, and spring-fed creeks, common in portions of the valley floor, provide excellent bear habitat. Additionally, the vegetation found along certain reaches of the Blackfoot River and its tributaries provide bears with cover, food and natural movement corridors.

Canada Lynx

The Canada Lynx Recovery Outline categorized lynx habitat and occurrence within the contiguous United States as (1) core areas, (2) secondary areas, and (3) peripheral areas. Core areas are defined as the areas with the strongest long-term evidence of the persistence of lynx populations. Core areas have both

persistent verified records of lynx occurrence over time and recent evidence of reproduction. Six core areas and one ‘provisional’ core area are identified within the contiguous United States. The Blackfoot River watershed is located within the Northwestern Montana/Northeastern Idaho Core Area (Ruediger et al. 2000). The watershed is a stronghold for the Canada lynx in the northern Rocky Mountains. Based on ongoing research in the upper and middle Blackfoot areas, lynx populations appear stable, although low reproductive rates are characteristic of this population. Since 1998, over eighty lynx have been monitored in the watershed, providing information on habitat use, reproduction, mortality, and movement. This research has shown that the watershed contains some of the most critical habitat for lynx in the continental United States. Large, intact spruce/subalpine fir forests above 4,000 feet in the watershed provide high quality habitat for lynx and for snowshoe hares, the primary lynx food source. Regenerating forest stands are often used as foraging habitat during the snow-free months while older, multi-storied stands serve as denning and year-round habitat (Blackfoot Challenge 2005).

Northern Rocky Mountain Gray Wolf

The Northern Rocky Mountain Gray Wolf Recovery Plan established three recovery zones in Montana, Idaho, and Wyoming. The Blackfoot River watershed is in the Northwest Montana Recovery Area (USFWS 1987). In March 2009, the Service removed the gray wolf from the list of threatened and endangered species in the western Great Lakes, the northern Rocky Mountain states of Idaho and Montana, and parts of Washington, Oregon, and Utah (USFWS 2009c). The status of the gray wolf, however, is not yet resolved due to the likelihood of litigation over delisting. As of 2009, Montana Fish, Wildlife and Parks has confirmed the presence of four resident wolf packs and estimates that at least twenty-five to thirty-five wolves inhabit the watershed.

CULTURAL RESOURCES

The Service has a trust responsibility to American Indian tribes that includes protection of the tribal sovereignty and preservation of tribal culture and other trust resources.

Currently, the Service does not propose any project, activity, or program that would result in changes in the character of, or adversely affect, any historical cultural resource or archaeological site. When such undertakings are considered, the Service takes all necessary steps to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Service pursues compliance with Section 110 of the NHPA to survey, inventory, and evaluate cultural resources.

SOCIOECONOMIC ENVIRONMENT

The project area encompasses an 824,024-acre ecosystem that includes portions of Missoula, Powell, and Lewis and Clark counties. Parts of these counties make up the Blackfoot River watershed in western Montana. The watershed is bordered to the east by the Continental Divide, to the south by the Garnet Mountains, to the north by the Bob Marshall and Lincoln-Sagegoat Wilderness Areas, and to the west by the Rattlesnake Wilderness Area. The center of the project area lies about 55 miles east of Missoula. The proposed expansion involves the acquisition of an additional 80,000 acres of conservation easements from willing sellers on private land within the watershed.

The Blackfoot River watershed includes the communities of Lincoln, Helmville, Ovando, Seeley Lake, Greenough, Potomac, and Bonner and spans portions of Missoula, Powell, and Lewis & Clark counties. There are approximately 8,100 people and 2,500 households in the watershed. In this 1.5 million-acre watershed, this amounts to less than one person per square mile. The population is spread throughout the valley, with population densities reaching 300 people per square mile in Seeley Lake, Potomac, and Bonner. The middle and high elevation portions of the watershed remain largely undeveloped. In 1995, between 8% and 18% of the current residents of the watershed had their primary residence located out of state (Blackfoot Challenge 2005).

Most of the rural population is involved in ranching and livestock production. Hunting of a wide variety of game species happens on private lands. A seasonal influx of tourists are attracted to the Blackfoot Valley for opportunities to bird watch, mountain-bike, horseback ride, backpack, camp, canoe, fish and view archeological and paleontological resources.

AGRICULTURAL RESOURCES

The economy of the Blackfoot Valley is largely agrarian. Large cattle ranches dominate the private lands within the project area. The population is sparse and towns are small and widely-scattered.

LANDOWNERSHIP

Landownership in the watershed is 54% federal (U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management), 10% state (Department of Natural Resources and Conservation, Montana Fish, Wildlife and Parks, and University of Montana), 31% private, and 5% by corporate timber company (Plum Creek Timber Company) (see figure 3). Most of the middle and high elevation forested lands within the watershed are administered by the USFS. Private lands are concentrated in the low elevation portions of the watershed. Landownership patterns in the watershed have changed in recent years due to large-scale transfers of PCTC lands. Project areas where a mosaic of private and public ownership exist are under the greatest threat and are in most need of conservation protection.

PROPERTY TAX

Currently, landowners pay property taxes on their private lands to the counties. The Blackfoot Valley WMA expansion is a proposed conservation easement program; the land does not change hands and, therefore, the property taxes paid by the landowner to the county are not affected. No changes to the tax base are anticipated.

PUBLIC USE AND WILDLIFE-DEPENDENT RECREATIONAL ACTIVITIES

Hunting and fishing are very popular throughout the project area. Hunting for a variety of wildlife includes waterfowl, upland game birds, elk, moose, deer, black bear, bighorn sheep, mountain lion, and furbearers. Private landowners often give permission for hunting and fishing on their land. Control of public access to the land would remain under the control of the landowner.

4 Environmental Consequences

This chapter assesses the environmental impacts expected to occur from the implementation of alternatives A or B, as described in chapter 2. Environmental impacts are analyzed by issues for each alternative and appear in the same order as discussed in chapter 2.

EFFECTS ON THE BIOLOGICAL ENVIRONMENT

This section describes the estimated effects on climate change, wildlife habitat, and water resources of carrying out alternatives A and B.

CLIMATE CHANGE

Climate change is the pre-eminent issue for conservation in future decades. Current trends in climate change are expected to affect high mountain ecotypes and lower elevation, snow-melt dependent watersheds, such as those found in the Blackfoot Valley WMA project area, more acutely than some other landscape ecotypes.

Predictions regarding the specific effects of climate change in the Blackfoot Valley are in the early stages. Empirical data indicates that during the 20th century, the region has grown warmer, and in some areas drier. Annual average temperature has increased 1–3 degrees over most of the region. This seemingly modest increase masks much larger shifts in minimum winter temperatures (10°F) and shifts in maximum summer temperatures (7°F). In the 2007 Introduction to the Summary for Policy Makers Synthesis Report, the Intergovernmental Panel on Climate Change described that average air temperatures may rise by up to 6°Celsius by the end of this century according to regionally downscaled models from the Pacific Northwest (USFWS 2009b).

Changes in temperature and precipitation are expected to decrease snow pack and will affect stream flow and water quality throughout the CoCE. Warmer temperatures will result in more winter precipitation falling as rain rather than snow throughout much of the region particularly in mid-elevation basins where average winter temperatures are near freezing. This will result in

- Less winter snow accumulation;
- Higher winter streamflows;
- Earlier spring snowmelt;

- Earlier peak spring streamflow and lower summer streamflows in rivers that depend on snowmelt (USFWS 2009b).

As glaciers and alpine snow fields melt and winters warm in Montana, specialized habitat for fish and wildlife species is expected to diminish. Snow conditions that facilitate hunting success for forest carnivores, such as Canada lynx, are now changing due to winter warming (Stenseth 2004). High elevation forest plants such as whitebark pine, (an important food source for grizzly bears) and other birds and mammals throughout the Crown of the Continent and Greater Yellowstone ecosystems (Kendall and Arno 1989) will also be negatively impacted by winter warming. Whitebark pine is susceptible to increased mortality as the incidence of drought, high elevation wildfire, and mountain pine beetle attacks, all associated with a warming climate increase (Hanna et al. 2009).

This warming may also have impacts on grizzly bears. Important food resources are expected to decline as warming causes an increase in whitebark pine blister rust reducing the availability of the pine to bears. This may result in shifts in foraging elevations and potential increase in grizzly bear conflict with humans and livestock.

According to Service Grizzly Bear Recovery Coordinator, Dr. Christopher Servheen, (University of Montana, Missoula, MT; personal interview in person, 11 June 2008) it is highly likely that grizzly bear delayed fall den entry dates and earlier spring-emergence dates will begin occurring in Blackfoot Valley and other portions of the CoCE as they have in the Greater Yellowstone area, related to climate change. This will also potentially increase their likelihood of human-caused mortality from increased encounters (Endangered Species Coalition 2009).

As late summer flows are affected by global warming, fewer rivers will be able to supply ample cold water required by species such as bull trout. Bull trout distribution is expected to be interrupted by the heightened ambient air temperatures (Endangered Species Coalition 2009).

The impacts of climate change will extend beyond the boundaries of any single refuge or easement program and will therefore require large-scale, landscape level solutions that extend throughout the CoCE. The collective goal of the proposed Blackfoot Valley WMA expansion is to build resilience in ecological

systems and communities, so that, even as climate conditions change, the CoCE will continue to support its full range of native biodiversity and ecological processes. Building resilience includes maintaining intact, interconnected landscapes, and restoring fragmented or degraded habitats.

ADAPTATION, MITIGATION, AND ENGAGEMENT

The Service's strategic response to climate change involves three core strategies: adaptation, mitigation, and engagement (USFWS 2009b). Through adaptation, the impacts of climate change on wildlife can be reduced by conserving habitats expected to be resilient.

Increased landscape connectivity is one of the most effective methods to help wildlife adapt to climate change. Large landscapes, especially those within mountains, and the ability to move between them, provide the best chances for plant and animal species, as well as ecosystems and ecological processes, to survive changing conditions. The ability to migrate to higher latitudes, higher elevations, or cooler exposures can make possible the successful adaptation of plants and animals. The Yellowstone to Yukon Ecosystem, which includes the CoCE, is the most intact mountain ecosystem remaining on earth and is one of the world's few remaining areas with the geographic variety and biological diversity to accommodate the wide-scale adaptive responses that might allow whole populations of animals and plants to survive (Yellowstone to Yukon Conservation Initiative 2009).

One of the results of changing climates is the alteration of the habitats upon which wildlife depend. Wildlife will have to adapt to changes in habitat to survive. Protecting and linking contiguous blocks of unfragmented habitat will facilitate movement of wildlife responding to climate change.

Carbon sequestration forms one of the key elements of mitigation. The expansion of the Blackfoot Valley WMA would protect forested areas from subdivision. Forests are critically important in the efforts to remove CO₂ from the atmosphere and mitigate climate change. The CO₂ from the atmosphere is absorbed by trees through photosynthesis and stored as carbon in the tree trunk, branches, foliage, and roots, with oxygen as a byproduct. The organic matter in forest soils, such as the humus produced by the decomposition of dead plant material, also acts to store carbon.

Engagement involves cooperation, communication, and partnerships to address the conservation challenges presented by climate change (USFWS 2009b). The proposed project is located in an area that is designated as a high priority for conservation and linkage protection by many of our partners including Montana Fish, Wildlife and Parks; The National Fish and Wildlife Foundation; The Nature

Conservancy; The Blackfoot Challenge; Trout Unlimited; The Mountain Land Reliance; and The Yellowstone to Yukon Initiative. Many of these organizations are involved in trans-boundary conservation, protecting and connecting habitat in the United States and Canada. Strong partnerships have already been developed to meet the challenges of climate change and wildlife resources.

Given the level of public and private partnerships focused on land protection within the Blackfoot Valley, this landscape is arguably one of the most promising large-scale opportunities remaining in North America for species resiliency and adaptation in the face of climate change.

WILDLIFE HABITAT—ALTERNATIVE A

Although efforts by the Service's PFW program and partners would continue to enhance habitat on some private lands, degradation of resources on many unprotected lands would continue. These potential impacts could result in the further decline of migratory birds, resident wildlife, and listed species.

The existing project objectives would most likely be accomplished with the acquisition of the remaining authorized acreage (approximately 4,500 acres).

Many acres of land would likely be developed for recreational home sites or isolated commercial uses, as economic forces change in the future. In recent years, subdivision and the demand for recreational property has been present in western Montana, posing the greatest single threat to the Blackfoot Valley. Lands adjacent to natural areas are choice home sites and are targeted for residential development. Long-time family ranches are beginning to be sold and are commanding high prices as recreational properties.

No action would result in loss of opportunity to protect historically important upland and wetland habitats. Without the protection of private land with conservation easements, the future of wildlife habitat in the project area would be uncertain.

Habitat fragmentation is one the greatest impacts caused by rural subdivision and residential development. However, under state law, the subdivision process is not difficult—land may be split into lots of 160 acres or greater without local review or approval. Moreover, with no county zoning in place, small lot subdivisions are possible.

Private land subdivision results in smaller ownerships. Subsequent effects, including those listed below, would likely impact wildlife:

- fragmentation
- invasive plant infestations
- increased fencing, roads, and vehicle traffic

- loss of habitat and travel corridors for wildlife
- decreased ecosystem resiliency for responding to the effects of climate change

In addition, these effects would bring increased human presence in the form of snowmobiles, predator-prey shifts, and sources of disturbance that can disrupt wildlife movement patterns and render habitat unusable.

Loss of habitat and travel corridors for wolverine, Canada lynx, grizzly bear, gray wolf, and other species would likely have a negative impact on these species' populations in the Blackfoot Valley. Research has shown that grizzly bears move between private lands in the valley, Glacier National Park, and the Lewis and Clark National Forest, all of which are part of the Northern Continental Divide ecosystem (USFWS 1993).

These key geographic and biological linkages can be lost and wildlife populations isolated once an area is fragmented by subdivisions or other development.

Increased human settlement can also result in increased human-wildlife conflicts, as well as impact actions to control important natural ecological events such as fire and seasonal floods.

Conversion of native prairie has an effect on bird populations. In the fescue prairie region of Alberta, Canada, total passerine populations and diversity have decreased significantly as native rangeland has been converted to cereal grain production (Owens and Myers 1972). Overall, grassland bird populations are decreasing faster and over a larger area than any other avian species group, including Neotropical migrants (Knopf 1996).

WILDLIFE HABITAT—ALTERNATIVE B

Expanding the Blackfoot Valley WMA would provide for the conservation of an additional 80,000 acres of important habitat on private land. This program would help maintain the uniqueness of the Blackfoot Valley and complement conservation efforts of the MFWP, TNC, and other federal and state agencies.

The fact that the Blackfoot Valley remains biologically and ecologically intact is a tribute to the area's ranchers and residents, who have long recognized what this unique and important landscape represents for ranching and wildlife. The project aims to ensure habitat for wildlife remains intact in perpetuity and, by doing so, strengthens the ranching heritage of the Blackfoot Valley.

Conservation easements within the Blackfoot Valley WMA would help alleviate habitat fragmentation issues. Key biological linkages would facilitate wildlife movement and provide for wildlife habitat requirements. The potential for human-wildlife

conflicts would be greatly reduced and resiliency in response to climate change would be maintained.

Compatible agricultural practices such as livestock grazing or haying would continue, while sodbusting (breaking of native rangeland) would be prohibited. Easements would maximize the connectivity with other protected lands and decrease the negative impacts of habitat fragmentation on migratory birds (Owens and Myers 1972).

WATER RESOURCES—ALTERNATIVE A

The prospect of residential development in the Blackfoot Valley represents a potentially significant threat to the aquatic habitat. Sewage-derived nutrient additions to streams and lakes could have detrimental effects of the aquatic ecology (Wernick et al. 1998).

Housing developments can also result in additional wetland drainage, water diversion, and introduction of invasive species. Development could also change drainage patterns or the rate of surface runoff, increasing soil erosion and non-point source pollution.

As demand for potable water increases for new subdivisions, water rights could be questioned and challenged to a greater extent in the future. Groundwater aquifers would receive more demand, resulting in potential degradation to the hydrology of some wetland areas.

Conversion of grasslands to cropland has been documented to increase sedimentation and pesticide runoff into wetlands. Tillage increases the sediment load into wetlands when compared to grasslands (Gleason and Euliss 1998, Kantrud et al. 1989), primarily due to wind erosion.

WATER RESOURCES—ALTERNATIVE B

Water resources on 80,000 acres would be protected from increased non-point source pollution from residential subdivision, commercial development, and draining of wetlands, all of which are prohibited under the proposed easement program.

The landowner would continue to own and control water rights.

EFFECTS ON THE SOCIOECONOMIC ENVIRONMENT

This section describes the estimated effects of alternatives A and B on landownership and land use, oil and gas exploration and development, wind energy development, public use, and economic impacts.

LANDOWNERSHIP AND LAND USE— ALTERNATIVE A

The resources studied by the Service for conservation easements in the expanded project area would remain in private ownership with no restrictions. Ranching opportunities could be reduced when landowners begin to split tracts into smaller lots.

Landowners that subdivide could increase their revenue by developing recreational home sites. With subdivision, tracts could potentially increase in value if there is desire to cluster housing or to keep open space for future housing developments.

The community would lose open space and the aesthetics of the Blackfoot Valley would diminish significantly. Subdivision and development would reduce hunting and wildlife observation opportunities and diminish revenue associated with these activities to local communities.

LANDOWNERSHIP AND LAND USE— ALTERNATIVE B

While many western Montana valleys are experiencing rapid population growth, the rate of population growth in the watershed remains modest. The population in the watershed is projected to increase to approximately 8,680 by 2010 (Blackfoot Challenge 2005). Much of the population increase is attributable to immigration from other states. New residents are attracted to the area because of its outstanding scenic beauty, intact landscapes, abundance of wildlife, recreational opportunities, rural character, and proximity to the urban centers of Missoula and Helena.

VALUE OF INTACT ECOSYSTEMS

Humans influence every ecosystem on earth, leading to impairment of natural ecosystem structure and function (MEA 2005). Converting native land to row-crop agriculture, suppressing fire, diverting water flow, increasing nutrient and toxic pollution, altering global precipitation patterns and gas concentration, and homogenizing and lowering global biodiversity are a few of the ways humans have altered ecosystems. North American forests, savannas, and grasslands have experienced substantial losses, whereas woody savanna, shrub land, and desert areas have expanded because of desertification and woody expansion into grasslands (Wali et al. 2002), inevitably leading to changes in ecosystem function (Dodds et al. 2008).

Alternative A

Under the no action alternative, the threat of habitat fragmentation will continue unabated. Landowners

may continue to face economic pressures to subdivide their ranches. Habitat fragmentation will compress the project area, leaving fewer larger parcels of intact habitat.

Alternative B

Conserving native land cover is an important component of maintaining ecosystem structure and function. Under the proposed action, native forest habitats would remain intact, continuing to provide ecosystem goods and services to landowners and local communities. Ecosystem services include (1) soil erosion control, (2) water supply, (3) biodiversity, and (4) carbon sequestration. The proposed action would help protect valuable ecosystem services (see figure 4). Furthermore, it would prevent the prohibitively high cost of restoration.

OIL AND GAS EXPLORATION AND DEVELOPMENT—ALTERNATIVE A

Oil and gas development would continue to occur on private lands along the project area. Stipulations to protect the surface estate would be governed by existing state regulations.

OIL AND GAS EXPLORATION AND DEVELOPMENT—ALTERNATIVE B

The proposed easement program would not preclude oil and gas exploration or development on private land. Typically, conservation easements do not affect subsurface estates (oil and gas deposits) because the Service only acquires rights associated with surface ownership. In many places where the subsurface estate has been severed from surface ownership, including those in the Blackfoot Valley, the landowner does not own the subsurface rights; this means that the easement that the Service acquires from the landowner is junior to the subsurface rights.

In instances where a landowner owns both the surface and the subsurface estate, the Service would treat oil and gas development as a permitted use and provide for such development in the easement document. Easements would contain reasonable surface stipulations for such actions as revegetation of disturbed areas, access, and site reclamation.

WIND ENERGY DEVELOPMENT— ALTERNATIVE A

Wind development within the Blackfoot Valley may occur on privately owned lands. Wind energy effects on the landscape include fragmentation and vertical structural barriers. The Service would focus on assisting with proper sighting of towers, because the placement of towers and associated infrastructure is critical in reducing impacts to habitat and wildlife.

**WIND ENERGY DEVELOPMENT—
ALTERNATIVE B**

Wind development within the Blackfoot Valley Conservation Area would not occur on conservation easements due to restrictions on wind development. This reduces fragmentation within the Valley from the placement of towers and associated infrastructure development. This improves wildlife corridors' integrity throughout the valley. Restricting wind towers also prevents mortality from direct strikes of towers by migratory birds and other avian wildlife species.

PUBLIC USE—ALTERNATIVE A

The Service would not purchase additional conservation easements within the identified expansion area and landowners would continue to manage public use.

PUBLIC USE—ALTERNATIVE B

Conservation easements purchased on private tracts would not change the landowner's right to manage public access to their property.

Under the expanded easement program private landowners would continue to retain full control

over their property rights, including allowing or restricting hunting and fishing on their lands. This is different from the MFWP's block management program, where participating landowners are paid to provide hunter access to their private lands.

ECONOMIC EFFECTS—ALTERNATIVE A

Economic impacts will remain at current levels. There are currently 1.83 FTE employees working at the Blackfoot Valley WMA whose total wages amounted to \$136,957 or an average of approximately \$74,700 per employee. Assuming employees spend 79 percent of their earnings locally, the existing annual economic impacts related to the employment at Blackfoot Valley WMA are \$108,196 annually.

According to Service staff, operating expenditures are \$19,047 annually. When combined with employment related economic impacts, the baseline economic activities associated with the existing Blackfoot Valley WMA are \$127,243.

ECONOMIC EFFECTS—ALTERNATIVE B

Increases in employment, annual operating expenditure and easement purchases would contribute to the economic activity that the Complex generates in the study area. The socioeconomic

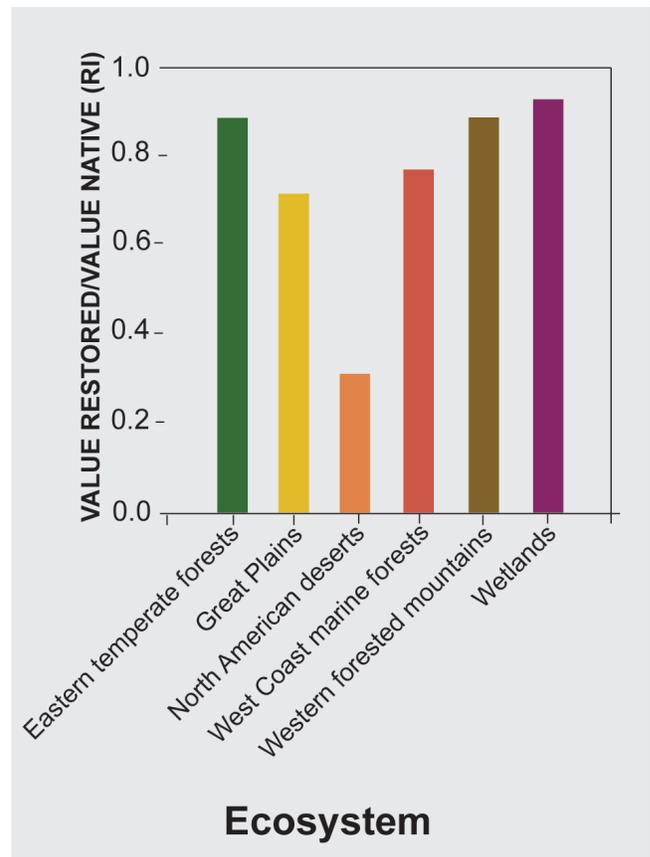
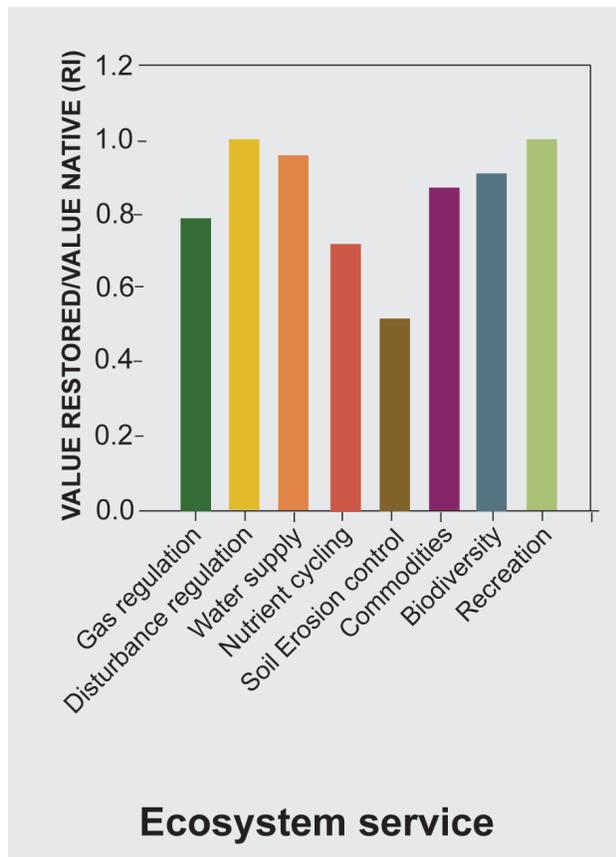


Figure 4. Relative native and restored benefits of ecosystem goods and services. The relative value, RI, is determined as the ratio of estimated benefits derived from native and restored acreages per year. (Source: Dodds et al. 2008)

impact of visitor expenditure is not included in this analysis as historic public visitor data at conservation areas is not available and visitor increases due to public awareness of conservation activities is difficult to quantify.

According to Service staff, new employment associated with the expansion of the Blackfoot Valley WMA will add 1.67 FTEs to a total employment of 3.5 FTEs. New employment totals \$91,518 in salaries or an average of \$54,911 per new employee. Assuming employees spend 79 percent of their earnings locally, the direct socioeconomic impacts of increased employment at Blackfoot Valley WMA is \$72,299 annually.

Alternative B would add approximately \$19,848 in operating expenditures associated with landowner management, employee training and travel expenses. These funds are spent on local goods and services and therefore directly impact the economy in the area.

The direct economic impacts of easement acquisitions are more difficult to attribute to the study area as it is less obvious where landowners may spend this income. In the Blackfoot Valley WMA, easements are worth an estimated \$64,000,000. The total direct economic impacts related to the Blackfoot Valley WMA under management alternative B are estimated at \$219,390, an increase of \$92,147 above baseline impacts.

UNAVOIDABLE ADVERSE IMPACTS

Any adverse effects that may be unavoidable while carrying out alternatives A and B are described below.

ALTERNATIVE A

The adverse impacts of degradation and habitat fragmentation would be expected to be more widespread and prevalent in the project areas.

ALTERNATIVE B

No direct or indirect unavoidable adverse impacts to the environment would result from the selection of alternative B. The easement program would not result in unavoidable adverse impacts on the physical or biological environment. The selection of an approved boundary would not, by itself, affect any aspect of landownership or values.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Any commitments of resources that may be irreversible or irretrievable as a result of carrying out alternatives A and B are described below.

ALTERNATIVE A

There would be no additional commitment of resources by the Service if no action is taken.

ALTERNATIVE B

There would not be any irreversible or irretrievable commitments of resources associated with establishing the conservation easement program, as lands will only be acquired as funding is available. Once easements are acquired, irreversible and irretrievable commitments of funds to protect these lands (such as expenditure for fuel and staff for monitoring) would exist.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

This section describes the short-term effects versus long-term production from the expected actions in alternatives A and B.

ALTERNATIVE A

Ranches may be sold to developers for short-term gains, which would have a negative impact on the long-term biological productivity of the area.

Over the long-term, the costs to counties to sustain development in rural areas could be significant (see the Landownership and Land Use section above).

ALTERNATIVE B

The proposed conservation easement program would maintain the long term biological productivity of the river valley ecosystem, including increased protection of endangered and threatened species and maintenance of biological diversity.

The nation would gain the protection of species for future generations of Americans. The public would gain long term opportunities for wildlife-dependent recreational activities from the continued presence of wildlife in the Front.

CUMULATIVE IMPACTS

This section describes the cumulative impacts that may result from the combination of expected actions in alternatives A or B, together with other biological and socioeconomic conditions, events, and developments.

ALTERNATIVE A

Current Service program work such as Partners for Fish and Wildlife would continue in the Blackfoot Valley. The Service would continue to

work cooperatively with landowners to voluntarily improve habitat on private land.

The Service would also continue to monitor and enforce easements within the current project boundary up to 23,500 acres. The existing easement program would have long-term positive impacts on wildlife habitat and result in the long-term conservation of migratory birds, threatened, and endangered species, native plants, and the overall biological diversity of the Blackfoot Valley for the 165,000 acre project area. The current project area does not encompass the entire watershed, and therefore, much of the watershed would be available for subdivision and development for residential and commercial purposes.

ALTERNATIVE B

The proposed easement program would have long term positive impacts on wildlife habitat and result in the long term conservation of migratory birds, threatened and endangered species, native plants, and the overall biological diversity of the Blackfoot Valley WMA project area and CoCE.

Within the CoCE, areas that were not suitable for homesteading and settlement were designated as federal lands. Settlers selected the milder and fertile valleys. These areas are currently under the greatest developmental pressure.

Because of these threats and pressures, the Service has defined three project areas (Blackfoot Valley Wildlife Management Area expansion, Rocky Mountain Front Conservation Area expansion, and Swan Valley Conservation Area) within the CoCE to concentrate strategic acquisition. The cumulative effect of the ongoing projects is to (1) maintain biological diversity related to wildlife values, (2)

link together existing protected areas, (3) preserve existing wildlife corridors, and (4) protect the large, intact, functioning ecosystem, while maintaining the rural character and agricultural lifestyle of western Montana. The Land and Water Conservation Fund and potential conservation partners would provide funding for these efforts. Table 1 shows the proposed acquisition acreage, type of acquisition tool, focal species, and key partners for each of the three project areas, Blackfoot Valley WMA expansion, Rocky Mountain Front Conservation Area expansion, and Swan Valley Conservation Area.

The annual operations budget related to the current easement programs within the Benton Lake National Wildlife Refuge Complex is \$22,123. These funds are spent on local goods and services and therefore directly impact the economy in the study area. An estimated 6.167 FTE are devoted to the two existing project areas (Blackfoot Valley Wildlife Management Area and Rocky Mountain Front Conservation Area). These 6.167 FTEs have an average salary of \$46,838 per employee or a total of \$288,832. Using the Bureau of Labor Statistics Consumer Expenditure Survey data for individuals in these income categories, roughly 79 percent of annual income is spent locally. Assuming employees spend 79 percent of their earnings locally, the socioeconomic impacts of increased employment among all conservation areas is \$228,177 annually.

Combining the effects of Service employment and operations, the total economic activity generated by the conservation areas is approximately \$250,300 annually.

If all three conservation area proposals occur, as described by alternative B, new total direct economic impact would be \$531,620 annually, an increase of \$281,320 from current baseline impacts.

Table 1. Summary of the project proposal for the Crown of the Continent ecosystem.

<i>Project Area</i>	<i>Proposed Project Area</i>	<i>Potential New Acreage</i>	<i>Type of Acquisition Tool</i>	<i>Focal Species</i>	<i>Key Partners</i>
Blackfoot Valley Wildlife Management Area Expansion	Expand existing area from 165,000 acres to 824,024 acres	80,000 acres	Conservation easement	Grizzly bear, Canada lynx, bull trout, westslope cutthroat trout, migratory birds	Private landowners, The Blackfoot Challenge, The Nature Conservancy, Trout Unlimited
Rocky Mountain Front Conservation Area Expansion	Expand existing area from 561,700 acres to 918,000 acres	125,000 acres	Conservation easement	Grizzly bear, migratory birds, long-billed curlew, Sprague's pipit, McCown's longspur	Private landowners, The Nature Conservancy, The Conservation Fund, Richard King Mellon Foundation
Swan Valley Conservation Area	New proposed area of 187,400 acres	11,000 acres	Conservation easement and limited fee-title (less than 1,000 acres)	Grizzly bear, Canada lynx, bull trout, migratory birds: Lewis' woodpecker, black tern, trumpeter swan, olive-sided flycatcher	Private landowners, The Nature Conservancy, Trust for Public Lands, Swan Valley Ecosystem Center, Plum Creek Timber Company, Vital Ground, Trout Unlimited, Northwest Connections

5 Coordination and Environmental Review

The Service coordinated within the agency, as well as with other federal agencies and local agencies, while developing this EA. Coordination effort for contaminants and hazardous materials is described below.

The Service conducted this environmental analysis under the authority of the National Environmental Policy Act. The resulting document will be distributed to the project mailing list, and copies can be requested.

The analysis and documentation was prepared by a combination of field and regional Service staff, along with partners.

AGENCY COORDINATION

The Service has discussed the proposal to establish the project areas identified within the CoCE with landowners; conservation organizations; other federal agencies; tribal, state, and county governments; and other interested groups and individuals.

The Service held a public meeting to provide information and discuss the proposal with landowners and other interested citizens. Information on the proposed expansion of the Blackfoot Valley WMA has been made available to county commissioners in each of the three counties included in the project area.

At the federal level, the Service staff has briefed Senators Baucus and Tester as well as the Congressional delegation, and coordinated with representatives from other federal agencies such as

the Bureau of Land Management and the U.S. Forest Service. At the state level, Governor Schweitzer's staff, along with the Montana Fish, Wildlife and Parks, were briefed on the project.

Nongovernmental conservation groups are key to the success of the proposed project. Service staff has coordinated with partner organizations such as The Nature Conservancy, The Montana Land Reliance, and the Blackfoot Challenge.

CONTAMINANTS AND HAZARDOUS MATERIALS

Fieldwork for the pre acquisition contaminant surveys would be conducted, on a tract-by-tract basis, prior to the purchase of any land interest. Any suspected problems or contaminants requiring additional surveys would be referred to a contaminants specialist located in the Service's ecological services office in Helena, Montana.

NATIONAL ENVIRONMENTAL POLICY ACT

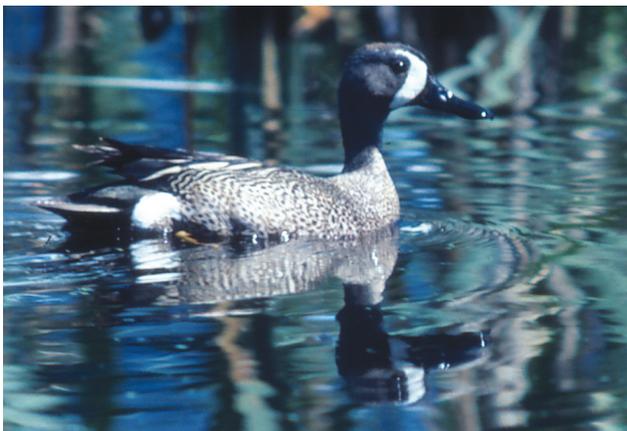
As a federal agency, the Service must comply with provisions of NEPA. An environmental assessment is required under NEPA to evaluate reasonable alternatives that will meet stated objectives, and to assess the possible impacts to the human environment. The EA serves as the basis for determining whether implementation of the proposed action would constitute a major federal action significantly affecting the quality of the human environment.

The analysis for, and development of this EA, facilitated the involvement of government agencies and the public in the decision making process.

LANDSCAPE CONSERVATION COOPERATIVES

The Service will use Landscape Conservation Cooperatives (LCCs) as a means to reach across broad landscapes, involve many partners, and function at a scale necessary to address wildlife adaptation in response to climate change.

The Blackfoot Valley WMA lies within the U.S. Fish and Wildlife Service's Great Northern Landscape



Robert Ballou/USFWS

Blue winged teal.

Conservation Cooperative (GNLCC)(see figure 5). GNLCC includes the mountain and transitional habitats in regions of Wyoming, Montana, Idaho, and the upper Green River basin in southern Wyoming and small parts of Colorado and Utah, and portions of the Interior Columbia Plateau reaching into Oregon and Washington westward to the Cascade Mountains. The GNLCC also includes the international landscapes of the interior British Columbia and Alberta, Canada, and covers the entirety of the northern Rocky Mountains and mid-continent lowlands of the interior northwest.

The GNLCC has identified priority species including bull trout, grizzly bear, Lewis’ woodpecker, trumpeter swan, westslope cutthroat trout, Arctic grayling, wolverine, willow flycatcher, sage grouse, burrowing owl, and Columbia spotted frog. Several of these species exist within the project area including wolverine, trumpeter swan, grizzly bear, westslope cutthroat trout, and bull trout.

The GNLCC works with a variety of science partners including many of which are also supporters of the proposed easement program. The protection of the Blackfoot Valley, through a conservation easement program and fee-title acquisition, will significantly contribute to the conservation of GNLCC priority habitats and the federal trust species identified above.

As the GNLCC continues to develop, an overarching priority will be to serve as a convening body, bringing together partners to address existing and future issues related to climate change and landscape scale conservation. The Service will work with existing partnerships within the Swan Valley to further refine priorities and leverage resources for acquisition.

DISTRIBUTION AND AVAILABILITY

Copies of the EA were sent to federal and state legislative delegations, agencies, landowners, private groups, and other interested individuals.

Additional copies of the document are available from the following offices and websites.

U.S. Fish and Wildlife Service
 Benton Lake National Wildlife Refuge Complex
 922 Bootlegger Trail
 Great Falls, MT 59404-6133
 406/727 7400

and

U.S. Fish and Wildlife Service
 Division of Refuge Planning
 P.O. Box 25486 DFC
 Denver, CO 80225
 303/236 4378



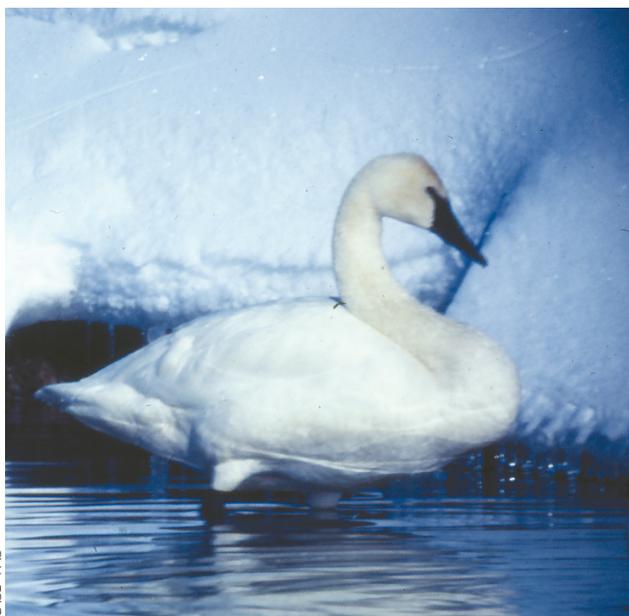
Figure 5. Great Northern Landscape Conservation Cooperative with Blackfoot Valley Wildlife Management Area expansion.

6 Draft Land Protection Plan

The land protection plan (LPP) provides a general description of the operations and management of the expanded Blackfoot Valley Wildlife Management Area, as outlined in alternative B, the proposed alternative, of the Blackfoot Valley WMA expansion environmental assessment. The U.S. Fish and Wildlife Service developed this LPP during the planning process to provide local landowners, governmental agencies, and the interested public with a general understanding of the anticipated management approaches for the proposed easement program. The purpose of the LPP is to present a broad overview of the Service's proposed management approach to wildlife and associated habitats, public uses, interagency coordination, public outreach, and other operational needs.

PROJECT DESCRIPTION

The Blackfoot Valley WMA is a large landscape conservation strategy to protect one of the last undeveloped, low elevation river valley ecosystems in western Montana (see figure 2, chapter 1). The U.S. Fish and Wildlife Service is proposing to expand the existing boundary of the Blackfoot Valley Wildlife Management Area from 165,000 acres to 824,024, and protect an additional 80,000 acres with conservation easements. The project area provides a



USFWS

Trumpeter swan.

vital habitat corridor between existing U.S. Forest Service boundaries, Bureau of Land Management properties, state wildlife management areas, Service waterfowl production areas, Nature Conservancy easements, Service conservation easements, and Partners for Fish and Wildlife projects. A protection program based on obtaining conservation easements was started for Blackfoot Valley in 1994, and it has experienced a great deal of support and success. Now there is new opportunity in the Blackfoot River Valley for easements that lie outside of the existing boundary. The popularity of the current program indicates that there would be support for the boundary expansion. The program also continues to complement other components of a broad partnership known as the "Blackfoot Challenge."

STRATEGIC HABITAT CONSERVATION

Strategic Habitat Conservation (SHC) is a means of applying adaptive management across large landscapes. SHC involves an ongoing cycle of biological planning, conservation design, conservation delivery, outcome-based monitoring, and assumption-based research. SHC uses science to focus conservation in the right places (USFWS 2008).

In 2004, the U.S. Fish and Wildlife Partners for Fish and Wildlife program led a statewide, strategic habitat conservation planning effort for focusing work in Montana. The state was divided into three broad geographic regions based on similar habitat types. Within each region, priority federal trust species and guilds were identified. The Montana Habitat and Population Evaluation Team (HAPET) office then assisted with gathering and creating spatially explicit models and data sets for priority trust resources. In addition, the scientific-based planning efforts of partner agencies and conservation organizations were incorporated. These include the Strategic Habitat Conservation Report prepared by the National Ecological Assessment Team (NEAT), Upper Missouri/Yellowstone/Upper Columbia River Ecosystem Team Focus Area Plan, the Montana Partners Program 1999 Focus Area Plan, Montana's Comprehensive Fish and Wildlife Conservation Strategy Plan, and The Nature Conservancy of Montana's Statewide Conservation Plan. Seven stakeholder meetings were held to gather input from other partners to identify focus areas and develop an appropriate conservation strategy. The 2007 Montana

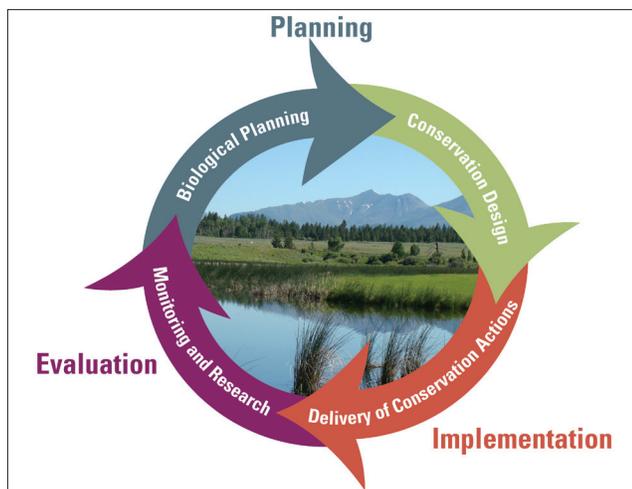


Figure 6. The elements of strategic habitat conservation.

Step-down Strategic Plan identified geographic focus areas, habitat accomplishment targets, and benefit to federal trust species. The comprehensive process ultimately produced ten conservation focus areas for Montana. The Blackfoot Valley WMA is within the identified focus areas.

The preparation of this project area land protection plan addresses the four key elements of SHC (1) planning, (2) design, (3) delivery, and (4) monitoring and research (see figure 6).

BIOLOGICAL PLANNING

According to the Montana Natural Heritage Program database (MTNHP 2009a) there are forty-one animal species of concern in the Blackfoot River watershed. These include invertebrates, birds, fish, mammals, reptiles, and amphibians. Federally listed animal species found in the Blackfoot River watershed include the threatened bull trout, grizzly bear, and Canada lynx.

Focal Species

In order to strategically conserve habitat within the Blackfoot Valley, the Service chose to focus on the grizzly bear, threatened bull trout, and Canada lynx. These species were chosen because they are federal trust resources, they represent the variety of key habitats and capture the needs of several other species in the Blackfoot Valley, and there is sufficient information about them to develop a land protection plan.

Population Objectives

Because each of the focal species for the Blackfoot Valley is protected under the Endangered Species Act, specific mission-based population objectives have been defined that correspond to the species' recovery.

Bull Trout

The Blackfoot River core area lies within the Clark Fork Recovery Unit. For the Blackfoot River core area, the total adult bull trout abundance, distributed among local populations, must exceed 1,000 fish, and adult bull trout abundance must exceed 2,500 (USFWS 2002). Trend criteria will be met when the overall bull trout population in the Clark Fork Recovery Unit is accepted, under contemporary standards of the time, as stable or increasing, based on at least 10 years of monitoring data.

Grizzly Bear

The Blackfoot Valley lies within the NCDE recovery zone. The Grizzly Bear Recovery Plan (USFWS 1993) specifies multiple thresholds that must be maintained before the grizzly bear population in the NCDE can be considered recovered. For the NCDE, the threshold is ten females with cubs inside Glacier National Park (GNP) and twelve females with cubs outside GNP, over a running 6-year average both inside the recovery zone and within a 10-mile area immediately surrounding the recovery zone, excluding Canada; twenty-one of twenty-three bear management units (BMUs) occupied by females with young form a running 6-year sum of verified sightings and evidence, with no two adjacent BMUs unoccupied; and known human-caused mortality not to exceed 4 percent of the population estimate based on the most recent 3-year sum of females with cubs. Furthermore, recovery cannot be achieved without occupancy in the Mission Mountains portion of the ecosystem.

Canada Lynx

Several preliminary objectives have been identified in the lynx recovery effort. The one most relevant to the Blackfoot Valley WMA is insuring that sufficient habitat is available to accommodate the long-term persistence of immigration and emigration between each core area and adjacent populations in Canada or secondary areas in the United States (USFWS 2005).

Limiting Factors

For wide-ranging species, such as grizzly bears, unplanned development leads to loss of habitat connectivity within the project area and, on a larger scale, between the CoCE and other historical or potential ranges. Riparian zones, for example, provide excellent habitat and cover for bears moving throughout the watersheds, but they are also among the most desired locations for building (Lolo National Forest 2003). An increase in development also leads to more frequent conflicts between bears and people due in large part to the increased presence of bear attractants. Human garbage, dog food, and bird seed can condition and habituate bears, leading to more interactions and conflicts with people. These factors can lead to human-caused grizzly bear mortality,

which in turn results in a decrease in grizzly bear reproduction and a loss of population and genetic viability. More than 17% of the NCDE is private land and an estimated 71% of bear-human conflicts and bear deaths occur on these private lands (Dr. Christopher Servheen, Grizzly Bear Recovery Coordinator, University of Montana, Missoula, MT; personal interview in person, 11 June 2008). Minimizing attractants on private lands and limiting subdivision are keys to reducing this threat to grizzly bears.

Lynx move between boreal habitats in Canada and the contiguous United States. Immigration of lynx from Canada plays a vital role in sustaining lynx in the contiguous United States (McKelvey et al. 2000). It is essential that landscape connectivity between lynx habitats and populations in Canada and the contiguous United States be maintained. Lynx movements may be negatively influenced by high traffic volume roads that bisect suitable habitat (USFWS 2005).

Ultimately, unmanaged growth and residential sprawl may be one of the biggest threats to the recovery of bull trout in the Clark Fork Recovery Unit (RU) as well. The entire RU holds many of the attributes that increasingly attract people seeking relief from the urban environment. Human population growth in western Montana and northern Idaho has accelerated. The way in which this growth is managed, and our ability to limit the impacts of growth, in particular on bull trout spawning and rearing streams, is pivotal to the success of bull trout recovery effort (USFWS 2002)

Increasing human populations have a direct impact on all of the other categories of risk that affect bull trout. Both legal and illegal angling (poaching) have direct impacts on bull trout populations, despite the

implementation of restrictive fishing regulations and strong educational efforts. The problem of illegal take of bull trout is intensified in stream corridors where roads provide access to highly visible (and therefore vulnerable) spawning stocks. (USFWS 2002).

Key Habitats for Protection

The USGS estimates that at least forty bears are present during all or part of the year in the watershed. In recent years, grizzly bear activity has increased in the watershed. Based on collared bear locations, the eastern portion of the Blackfoot Valley, in particular, appears to be an important habitat link for grizzly bears that are recolonizing historic ranges to the south (James J. Jonkel, Montana Bear Manager, region 2, USFWS; personal interview in person, 10 May 2010). Maintaining habitat connectivity is critical to sustaining grizzly bear. The connectivity sustains breeding, shelter, and foraging activities which are critical in maintaining sustainable subpopulations within the southern portion of the Northern Continental Divide Ecosystem.

Extensive population surveys and focused field research conducted since the mid-1990s indicates that the Blackfoot watershed contains the most critical, currently unprotected lynx habitat in the contiguous United States. The majority of this vulnerable habitat is in the Blackfoot Valley's Clearwater watershed and is managed by Plum Creek Timber Company. Although a significant portion of this privately-managed lynx habitat will be conserved as part of the Montana Legacy Project in 2010 and 2011, tens of thousands of acres of critical lynx habitat remain vulnerable to conversion and development in the Clearwater watershed.



USFWS

Subdivision development impacts habitat connectivity.

Dr. John Squires and others with the USFS Rocky Mountain Research Station began intensive Canada lynx field research in the Blackfoot Valley in 1997. This work is ongoing and represents the most comprehensive lynx research project ever conducted in the contiguous United States. Researchers worked to develop a Resource Selection Function surface that would help predict lynx habitat suitability and use across western Montana where lynx were thought to have occurred historically. Relocation data from 129 individual lynx and sixty-four known 80% kernel home ranges were compared to 1,000 similar kernels randomly located throughout the species' Montana range. Researchers then analyzed topographic, climatic, vegetative, and spectral imagery data to develop a spatial model predicting lynx occurrence. Lynx were fitted with conventional and global positioning system (GPS) collars in the Blackfoot Valley between 1997 and 2009. The resulting relocation data align closely with the predictive habitat model and highlight those lands in the watershed important for lynx conservation and recovery.

The most important and vulnerable lynx habitat in the watershed occurs in the northwest Blackfoot Valley's Clearwater drainage. These lands are important for the long-term viability of lynx in western Montana and their conservation would help ensure habitat connectivity between the Crown of the Continent ecosystem and the Mission Mountains and Rattlesnake federal and tribal wilderness complexes.

For bull trout, critical habitat has been designated and explicitly mapped in each RU. Critical habitats are those stream reaches and lakes deemed essential to the conservation of the species (USFWS 2002). To identify those habitats within each RU essential to the conservation of bull trout, the Service used the four biological indicators derived from the 2002 and 2004 bull trout draft recovery plans (USFWS 2002, USFWS 2004) and seven newly developed 'guiding principles'.

The four biological indicators are distribution, abundance, trend, and connectivity. The seven guiding principles are conserve opportunity for diverse life-history expression, conserve opportunity for genetic diversity, ensure bull trout are distributed across representative habitats, ensure sufficient connectivity among populations, ensure sufficient habitat to support population viability (for example abundance, trend indices), consider threats (for example climate change), and ensure sufficient redundancy in conserving population units.

CONSERVATION DESIGN

The design stage of the SHC process involves assessment of the current state of the system, formulation of habitat objectives, and determination of priority areas.

Current State of the System

In recent years, the mortality threshold for grizzly bear recovery in the NCDE has been exceeded, but the significance of these numbers cannot be evaluated until there is accurate information on population size. Through the use of genetic analysis on collected hair samples, researchers were able to determine that an estimated 765 grizzly bears make their home in the Northern Continental Divide. Of those 765, researchers estimate 470 bears are females. Female bears were also found throughout the entire study area, indicating a good reproductive potential for the species. Analysis of hair samples has allowed researchers to determine the genetic health of the grizzly bear population. Although overall genetic variation indicate a healthy population, it is only one piece of the puzzle that managers need for the recovery of grizzlies in the NCDE to be successful (Kendall et al. 2009).

Within the watershed, bull trout densities are very low in the upper Blackfoot River, but increase downstream of the North Fork. Streams that appear to be particularly important for the spawning of migratory bull trout include Monture Creek, the North Fork Blackfoot River, Copper Creek, Gold Creek, Dunham Creek, Morrell Creek, the West Fork Clearwater River, and the East Fork Clearwater River. Bull trout spawner abundance is indexed by the number of identifiable female bull trout nesting areas (redds). Data indicate that Monture Creek has an upward trend from 10 redds in 1989 to an average of 51 redds in subsequent years (Pierce et al. 2008). The North Fork also shows an upward trend from eight redds in 1989 to an average of fifty-eight redds between 1989 and 2008. The Copper Creek drainage (including Snowbank Creek) has experienced a resurgence of bull trout redds—from eighteen in 2003 to 117 in 2008—since the 2003 Snow Talon Fire. The total number of redds counted in these three streams (Monture Creek, North Fork, and Copper Creek) increased from thirty-nine in 1989 to 217 in 2000. With the onset of drought, bull trout redd counts then declined to 147 in 2008. These changes are attributed to protective regulations first enacted in 1990, restoration actions in spawning streams during the 1990s, and a period of sustained drought between 2000 and the present (Pierce et al. 2008).

Formulation of Habitat Objectives

There are currently approximately 365,000 acres of unprotected private land and 75,000 acres of commercial timber company land in the proposed Blackfoot Valley WMA. With the current levels of development and fragmentation within Blackfoot Valley, bull trout populations appear to be increasing while the pressure of human-cause mortality on grizzly bears for the NCDE population is higher than acceptable for recovery. Conservation easements provide an opportunity to prevent further

development and fragmentation that might reduce or reverse the positive trends in bull trout populations or increase human-grizzly interactions, putting further negative pressure on the NCDE population. Given that conserving all remaining private land with easements to prevent additional development is not a reasonable or desired goal, especially around the existing population centers of Lincoln, Helmville, Ovando, Seeley Lake, Greenough, Potomac, and Bonner, the Service has set a goal to protect 80,000 additional acres of existing private lands. Long-term monitoring of grizzly bears, lynx, and bull trout will be conducted and the goal of 80,000 acres will be periodically reevaluated.

Priority Areas

The Service is proposing to expand the Blackfoot Valley WMA by purchasing conservation easements to reduce future impacts of development and habitat fragmentation. Typically, the Service will purchase an easement for the entire ownership of a landowner, and therefore the priorities for the Blackfoot Valley WMA Land Protection Plan are based on the best available data on existing private ownerships. The Service generally focuses on parcels greater than 160 acres, however, parcels less than 160 acres may be considered if unique biological values exist. Also, buffer areas will be maintained around communities to provide rural communities the ability to meet their community development goals and objectives.

Given the models and habitat objectives, three priority areas have been developed (see figure 7). Areas where easements are expected to have the greatest benefit to grizzly bears, lynx, and bull trout have been designated as Priority 1. Priority 1 also includes areas where it appears feasible to link easements to create corridors across the valley. Priority 2 is a high priority for lynx and bull trout, but somewhat less important for grizzly bears. Priority 3 includes critical habitat for bull trout, but lower priority habitat for grizzly bears and lynx. These priority areas will be regularly re-evaluated, and may be adjusted as additional quantifiable data on the habitat needs and limiting factors for focal species in the Blackfoot Valley become available. The Monitoring and Research section below provides further details on this feedback loop.

CONSERVATION DELIVERY

On approval of a project boundary, habitat protection would occur through the purchase of conservation easements. It is the long-established policy of the Service to acquire minimum interest in land from willing sellers to achieve habitat acquisition goals.

The acquisition authority for the proposed action is the Fish and Wildlife Act of 1956 (16 U.S.C. 742 a-742j). The federal money used to acquire conservation easements from the Land and Water

Conservation Fund are derived primarily from oil and gas leases on the outer continental shelf, motorboat fuel tax revenues, and sale of surplus federal property. There could be additional funds to acquire lands, waters, or interest therein for fish and wildlife conservation purposes through congressional appropriations, the Migratory Bird Conservation Fund, the North American Waterfowl Conservation Act funds, and donations from non profit organizations.

The basic considerations in acquiring an easement interest in private land are the biological significance of the area, existing and anticipated threats to wildlife resources, landowner interest in the program, and the size of the parcel. The purchase of conservation easements would occur with willing sellers only and will be subject to available funding.

MONITORING AND RESEARCH

As the Blackfoot Valley Conservation Area project develops and conservation easements are purchased, grizzly bears, lynx and bull trout will continue to be monitored. The U.S. Fish and Wildlife Service, Montana Fish, Wildlife and Parks and USGS all have active grizzly bear monitoring and research projects. MFWP, in particular, is focused on developing a science-based population monitoring program that provides the information necessary to successfully manage bears in western Montana (Dood et al. 2006). Specifically, MFWP will monitor a representative



Collared grizzly bear movement data is used to assess populations.

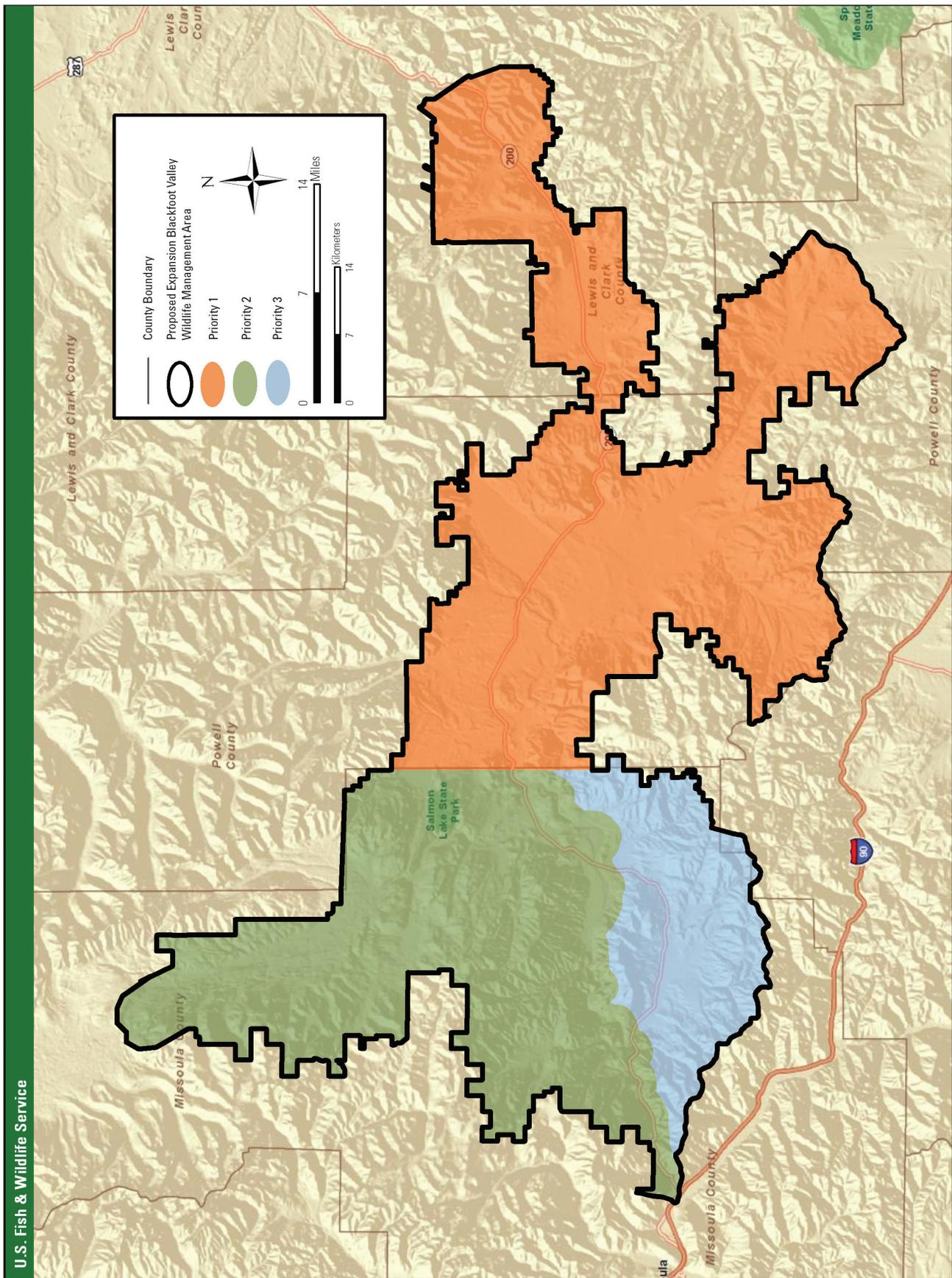


Figure 7. Blackfoot Valley project area priorities.

sample of twenty-five or more adult females in the NCDE to establish population trends, while MFWP will use verified sightings to document changes in bear distribution and linkage areas used, especially by female bears. MFWP will monitor mortality, including timing and causes, and gather survivorship data in cooperation with other agencies. In addition, results from the 2004 USGS NCDE Grizzly Bear DNA project will assist MFWP with bear population size estimation, distribution and population trend which will provide additional information for focusing acquisition efforts (USGS 2004).

The state of Montana began development of a bull trout restoration plan in 1993. The final plan, published in June 2000, sets goals, objectives and criteria for restoration; outlines actions to meet those criteria; and establishes a structure to monitor implementation and evaluate effectiveness of the plan (MBTRT 2000). One of the stated goals of the plan is to develop and implement a statistically valid population monitoring program. This monitoring program will be an effective tool to assess the status of bull trout in the Blackfoot Valley WMA.

Grizzly bears and bull trout have been identified as focal species for the Great Northern Landscape Conservation Cooperative. The GNLCC was established, in part, to foster cooperation between agencies and support monitoring and research where there are common interests. Continual evaluation of grizzly bear, bull trout, and lynx population trends and habitat use will be used to refine conservation efforts on the ground within the GNLCC. Ongoing efforts within the GNLCC will help provide information on population trends and habitat use for these science-based decisions.

COORDINATION

The proposed expansion of the Blackfoot Valley Wildlife Management Area has been discussed with landowners, conservation organizations, government officials, and other interested groups and individuals. The proposal and associated EA address the protection of native habitats, primarily through acquisition of conservation easements by the Service under the direction of the National Wildlife Refuge System.

An open house public meeting was held in Ovando, Montana, on May 19, 2010. Public comments were taken to identify issues to be analyzed for the proposed project.

Approximately seventeen landowners, citizens, and elected representatives attended and all attendees expressed positive support for the project.

In addition, the Service's field staff has contacted local government officials, other public agencies, sportsmen's and women's groups, and conservation groups, all of which have expressed an interest in

and a desire to protect the Blackfoot Valley from the pressures brought about by rural subdivision.

SOCIAL AND CULTURAL CONSIDERATIONS

The economy of the Blackfoot Valley is primarily agrarian and cattle ranches dominate the private lands within the project area. The human population is sparse and towns are widely scattered. Private lands are used for hunting. A seasonal influx of tourists is attracted to the area for opportunities to bird watch, mountain-bike, horseback ride, backpack, camp, canoe, and fish.

Historically, residents and county governments have been concerned about the amount of taxes paid to the counties when land protection programs such as this occur. Because this project is a conservation easement program, the land enrolled does not change hands, and taxes paid to the counties by the landowner are not affected.

Over the short-term, money paid by the Service for a conservation easement becomes another source of income for the landowner, with a portion of those dollars likely to be spent locally in the region. In addition, development of rural landscapes often leads to increased demand for services and higher costs to rural counties. These costs likely would not be incurred if the rural landscape were to remain intact.

In addition, the use of conservation easements precludes the necessity for county zoning within the program area. Proximity of protected lands also tends to enhance the property value of adjoining lands.

The ranchers' livelihood depend on natural resources (grass, water, and open space). The key to protecting the Blackfoot Valley lies primarily in sustaining the current pattern of ranching and low-density use. The easement program is not expected to cause any significant changes to the socioeconomic climate in the Blackfoot Valley, but rather, would help sustain the current condition.



Bull trout.

Appendix A

List of Preparers and Reviewers

<i>Author's Name</i>	<i>Position</i>	<i>Work Unit</i>
Kathleen Burchett	Project leader	USFWS, Benton Lake National Wildlife Refuge, Great Falls, MT
Mark Ely	Geographic information system (GIS) specialist	USFWS, Region 6, Division of Refuge Planning, Lakewood, CO
Kevin Ertl	Wildlife refuge specialist	USFWS, H2-O Waterfowl Production Area, Helmville, MT
Vanessa Fields	Wildlife biologist	USFWS, Benton Lake National Wildlife Refuge, Great Falls, MT
Randy Gazda	Wildlife biologist	USFWS, Partners for Fish and Wildlife, Great Falls, MT
Toni Griffin	Refuge planner	USFWS, Region 6, Division of Refuge Planning, Lakewood, CO
Greg Neudecker	Assistant Montana PFW coordinator	USFWS, Benton Lake National Wildlife Refuge, Great Falls, MT

<i>Reviewer's Name</i>	<i>Position</i>	<i>Work Unit</i>
Laurel Bowen	writer-editor	TBC Solutions, Clinton, TN
David Lucas	Chief of planning	USFWS, Region 6, Division of Refuge Planning, Lakewood, CO
Jim Stutzman	Montana state coordinator	USFWS, Partners for Fish and Wildlife, Great Falls, MT

Appendix B

List of Plants and Animals

MAMMALS

SCIENTIFIC NAME	COMMON NAME
<i>Mustela vison</i>	American Mink
<i>Taxidea taxus</i>	Badger
<i>Castor canadensis</i>	Beaver
<i>Eptesicus fuscus</i>	Big Brown Bat
<i>Ovis canadensis</i>	Bighorn Sheep
<i>Ursus americanus</i>	Black Bear
<i>Lynx rufus</i>	Bobcat
<i>Neotoma cinerea</i>	Bushy-tailed Woodrat
<i>Lynx canadensis</i> *	Canada Lynx
<i>Spermophilus columbianus</i>	Columbian Ground Squirrel
<i>Canis latrans</i>	Coyote
<i>Peromyscus maniculatus</i>	Deer Mouse
<i>Sorex monticolus</i>	Dusky or Montane Shrew
<i>Cervus canadensis</i>	Elk or Wapiti
<i>Martes pennanti</i> *	Fisher
<i>Myotis thysanodes</i> *	Fringed Myotis
<i>Spermophilus lateralis</i>	Golden-mantled Ground Squirrel
<i>Canis lupus</i>	Gray Wolf
<i>Ursus arctos</i> *	Grizzly Bear
<i>Phenacomys intermedius</i>	Heather Vole
<i>Lasiurus cinereus</i> *	Hoary Bat
<i>Myotis lucifugus</i>	Little Brown Myotis
<i>Myotis evotis</i>	Long-eared Myotis
<i>Myotis volans</i>	Long-legged Myotis
<i>Microtus longicaudus</i>	Long-tailed Vole
<i>Mustela frenata</i>	Long-tailed Weasel
<i>Martes americana</i>	Marten
<i>Sorex cinereus</i>	Masked Shrew
<i>Microtus pennsylvanicus</i>	Meadow Vole
<i>Microtus montanus</i>	Montane Vole
<i>Alces americanus</i>	Moose
<i>Sylvilagus nuttallii</i>	Mountain Cottontail
<i>Puma concolor</i>	Mountain Lion
<i>Odocoileus hemionus</i>	Mule Deer

SCIENTIFIC NAME	COMMON NAME
<i>Ondatra zibethicus</i>	Muskrat
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel
<i>Thomomys talpoides</i>	Northern Pocket Gopher
<i>Lontra canadensis</i>	Northern River Otter
<i>Erethizon dorsatum</i>	Porcupine
<i>Sorex preblei</i> *	Preble's Shrew
<i>Sorex hoyi</i>	Pygmy Shrew
<i>Procyon lotor</i>	Raccoon
<i>Vulpes vulpes</i>	Red Fox
<i>Tamiasciurus hudsonicus</i>	Red Squirrel
<i>Tamias ruficaudus</i>	Red-tailed Chipmunk
<i>Mustela erminea</i>	Short-tailed Weasel
<i>Lasionycteris noctivagans</i> **	Silver-haired Bat
<i>Lepus americanus</i>	Snowshoe Hare
<i>Myodes gapperi</i>	Southern Red-backed Vole
<i>Mephitis mephitis</i>	Striped Skunk
<i>Corynorhinus townsendii</i> *	Townsend's Big-eared Bat
<i>Sorex vagrans</i>	Vagrant Shrew
<i>Sorex palustris</i>	Water Shrew
<i>Zapus princeps</i>	Western Jumping Mouse
<i>Myotis ciliolabrum</i>	Western Small-footed Myotis
<i>Odocoileus virginianus</i>	White-tailed Deer
<i>Lepus townsendii</i>	White-tailed Jack Rabbit
<i>Gulo gulo</i> *	Wolverine
<i>Marmota flaviventris</i>	Yellow-bellied Marmot
<i>Tamias amoenus</i>	Yellow-pine Chipmunk

BIRDS

SCIENTIFIC NAME	COMMON NAME
<i>Recurvirostra americana</i>	American Avocet
<i>Botaurus lentiginosus</i> *	American Bittern
<i>Fulica americana</i>	American Coot
<i>Corvus brachyrhynchos</i>	American Crow
<i>Cinclus mexicanus</i>	American Dipper
<i>Spinus tristis</i>	American Goldfinch
<i>Falco sparverius</i>	American Kestrel
<i>Anthus rubescens</i>	American Pipit
<i>Setophaga ruticilla</i>	American Redstart
<i>Turdus migratorius</i>	American Robin
<i>Picoides dorsalis</i>	American Three-toed Woodpecker
<i>Spizella arborea</i>	American Tree Sparrow
<i>Pelecanus erythrorhynchos</i> *	American White Pelican
<i>Anas americana</i>	American Wigeon

SCIENTIFIC NAME	COMMON NAME
<i>Calypte anna</i>	Anna's Hummingbird
<i>Dendroica coronata auduboni</i>	Audubon's Warbler
<i>Haliaeetus leucocephalus</i> *	Bald Eagle
<i>Patagioenas fasciata</i>	Band-tailed Pigeon
<i>Riparia riparia</i>	Bank Swallow
<i>Hirundo rustica</i>	Barn Swallow
<i>Strix varia</i>	Barred Owl
<i>Bucephala islandica</i> **	Barrow's Goldeneye
<i>Megaceryle alcyon</i>	Belted Kingfisher
<i>Cypseloides niger</i> *	Black Swift
<i>Chlidonias niger</i> *	Black Tern
<i>Picoides arcticus</i> *	Black-backed Woodpecker
<i>Pica hudsonia</i>	Black-billed Magpie
<i>Poecile atricapillus</i>	Black-capped Chickadee
<i>Archilochus alexandri</i>	Black-chinned Hummingbird
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak
<i>Himantopus mexicanus</i> *	Black-necked Stilt
<i>Dendroica caerulescens</i>	Black-throated Blue Warbler
<i>Cyanocitta cristata</i>	Blue Jay
<i>Anas discors</i>	Blue-winged Teal
<i>Dolichonyx oryzivorus</i> *	Bobolink
<i>Aegolius funereus</i>	Boreal Owl
<i>Euphagus cyanocephalus</i>	Brewer's Blackbird
<i>Spizella breweri</i> *	Brewer's Sparrow
<i>Certhia americana</i> *	Brown Creeper
<i>Toxostoma rufum</i>	Brown Thrasher
<i>Molothrus ater</i>	Brown-headed Cowbird
<i>Bucephala albeola</i>	Bufflehead
<i>Icterus bullockii</i>	Bullock's Oriole
<i>Larus californicus</i>	California Gull
<i>Stellula calliope</i>	Calliope Hummingbird
<i>Branta canadensis</i>	Canada Goose
<i>Aythya valisineria</i>	Canvasback
<i>Hydroprogne caspia</i> *	Caspian Tern
<i>Carpodacus cassinii</i> *	Cassin's Finch
<i>Vireo cassinii</i>	Cassin's Vireo
<i>Bombycilla cedrorum</i>	Cedar Waxwing
<i>Poecile rufescens</i>	Chestnut-backed Chickadee
<i>Spizella passerina</i>	Chipping Sparrow
<i>Anas cyanoptera</i>	Cinnamon Teal
<i>Aechmophorus clarkii</i> *	Clark's Grebe
<i>Nucifraga columbiana</i> *	Clark's Nutcracker
<i>Spizella pallida</i>	Clay-colored Sparrow

SCIENTIFIC NAME	COMMON NAME
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow
<i>Bucephala clangula</i>	Common Goldeneye
<i>Quiscalus quiscula</i>	Common Grackle
<i>Gavia immer</i> *	Common Loon
<i>Mergus merganser</i>	Common Merganser
<i>Gallinula chloropus</i>	Common Moorhen
<i>Chordeiles minor</i>	Common Nighthawk
<i>Corvus corax</i>	Common Raven
<i>Sterna hirundo</i> *	Common Tern
<i>Geothlypis trichas</i>	Common Yellowthroat
<i>Accipiter cooperii</i>	Cooper's Hawk
<i>Empidonax occidentalis</i>	Cordilleran Flycatcher
<i>Junco hyemalis</i>	Dark-eyed Junco
<i>Junco hyemalis caniceps</i>	Dark-eyed Junco (Gray-headed)
<i>Junco hyemalis montanus</i>	Dark-eyed Junco (Montana Junco)
<i>Junco hyemalis mearnsi</i>	Dark-eyed Junco (Pink-sided)
<i>Phalacrocorax auritus</i>	Double-crested Cormorant
<i>Picoides pubescens</i>	Downy Woodpecker
<i>Empidonax oberholseri</i>	Dusky Flycatcher
<i>Dendragapus obscurus</i>	Dusky Grouse
<i>Podiceps nigricollis</i>	Eared Grebe
<i>Tyrannus tyrannus</i>	Eastern Kingbird
<i>Anas penelope</i>	Eurasian Wigeon
<i>Sturnus vulgaris</i> ***	European Starling
<i>Coccothraustes vespertinus</i>	Evening Grosbeak
<i>Buteo regalis</i> *	Ferruginous Hawk
<i>Otus flammeolus</i> *	Flammulated Owl
<i>Sterna forsteri</i> *	Forster's Tern
<i>Passerella iliaca</i>	Fox Sparrow
<i>Leucophaeus pipixcan</i> *	Franklin's Gull
<i>Anas strepera</i>	Gadwall
<i>Aquila chrysaetos</i> *	Golden Eagle
<i>Regulus satrapa</i>	Golden-crowned Kinglet
<i>Ammodramus savannarum</i> *	Grasshopper Sparrow
<i>Dumetella carolinensis</i>	Gray Catbird
<i>Perisoreus canadensis</i>	Gray Jay
<i>Perdix perdix</i> ***	Gray Partridge
<i>Leucosticte tephrocotis</i> *	Gray-crowned Rosy-Finch
<i>Ardea herodias</i> *	Great Blue Heron
<i>Ardea alba</i>	Great Egret
<i>Strix nebulosa</i> *	Great Gray Owl
<i>Bubo virginianus</i>	Great Horned Owl
<i>Centrocercus urophasianus</i> *	Greater Sage-Grouse

SCIENTIFIC NAME	COMMON NAME
<i>Tringa melanoleuca</i>	Greater Yellowlegs
<i>Anas crecca</i>	Green-winged Teal
<i>Picoides villosus</i>	Hairy Woodpecker
<i>Empidonax hammondi</i>	Hammond's Flycatcher
<i>Histrionicus histrionicus</i> *	Harlequin Duck
<i>Zonotrichia querula</i>	Harris's Sparrow
<i>Catharus guttatus</i>	Hermit Thrush
<i>Lophodytes cucullatus</i> **	Hooded Merganser
<i>Podiceps auritus</i> *	Horned Grebe
<i>Eremophila alpestris</i>	Horned Lark
<i>Carpodacus mexicanus</i>	House Finch
<i>Troglodytes aedon</i>	House Wren
<i>Charadrius vociferus</i>	Killdeer
<i>Passerina amoena</i>	Lazuli Bunting
<i>Empidonax minimus</i>	Least Flycatcher
<i>Calidris minutilla</i>	Least Sandpiper
<i>Aythya affinis</i>	Lesser Scaup
<i>Tringa flavipes</i>	Lesser Yellowlegs
<i>Melanerpes lewis</i> *	Lewis' Woodpecker
<i>Melospiza lincolni</i>	Lincoln's Sparrow
<i>Lanius ludovicianus</i> *	Loggerhead Shrike
<i>Numenius americanus</i> *	Long-billed Curlew
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher
<i>Asio otus</i>	Long-eared Owl
<i>Oporornis tolmiei</i>	MacGillivray's Warbler
<i>Anas platyrhynchos</i>	Mallard
<i>Limosa fedoa</i>	Marbled Godwit
<i>Cistothorus palustris</i>	Marsh Wren
<i>Falco columbarius</i>	Merlin
<i>Sialia currucoides</i>	Mountain Bluebird
<i>Poecile gambeli</i>	Mountain Chickadee
<i>Zenaidura macroura</i>	Mourning Dove
<i>Vermivora ruficapilla</i>	Nashville Warbler
<i>Colaptes auratus</i>	Northern Flicker
<i>Colaptes auratus cafer</i>	Northern Flicker (Red-shafted)
<i>Accipiter gentilis</i> *	Northern Goshawk
<i>Circus cyaneus</i>	Northern Harrier
<i>Surnia ulula</i> **	Northern Hawk Owl
<i>Icterus galbula</i>	Northern Oriole
<i>Anas acuta</i>	Northern Pintail
<i>Glaucidium gnoma</i>	Northern Pygmy-Owl
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow
<i>Aegolius acadicus</i>	Northern Saw-whet Owl

SCIENTIFIC NAME	COMMON NAME
<i>Anas clypeata</i>	Northern Shoveler
<i>Lanius excubitor</i>	Northern Shrike
<i>Seiurus noveboracensis</i>	Northern Waterthrush
<i>Contopus cooperi</i>	Olive-sided Flycatcher
<i>Vermivora celata</i>	Orange-crowned Warbler
<i>Pandion haliaetus</i>	Osprey
<i>Seiurus aurocapilla**</i>	Ovenbird
<i>Myioborus pictus</i>	Painted Redstart
<i>Falco peregrinus*</i>	Peregrine Falcon
<i>Podilymbus podiceps</i>	Pied-billed Grebe
<i>Dryocopus pileatus*</i>	Pileated Woodpecker
<i>Pinicola enucleator</i>	Pine Grosbeak
<i>Spinus pinus</i>	Pine Siskin
<i>Falco mexicanus</i>	Prairie Falcon
<i>Sitta pygmaea</i>	Pygmy Nuthatch
<i>Loxia curvirostra</i>	Red Crossbill
<i>Mergus serrator</i>	Red-breasted Merganser
<i>Sitta canadensis</i>	Red-breasted Nuthatch
<i>Vireo olivaceus</i>	Red-eyed Vireo
<i>Sphyrapicus nuchalis</i>	Red-naped Sapsucker
<i>Podiceps grisegena</i>	Red-necked Grebe
<i>Phalaropus lobatus</i>	Red-necked Phalarope
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<i>Agelaius phoeniceus</i>	Red-winged Blackbird
<i>Aythya americana</i>	Redhead
<i>Larus delawarensis</i>	Ring-billed Gull
<i>Aythya collaris</i>	Ring-necked Duck
<i>Columba livia***</i>	Rock Pigeon
<i>Salpinctes obsoletus</i>	Rock Wren
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak
<i>Chen rossii</i>	Ross's Goose
<i>Buteo lagopus</i>	Rough-legged Hawk
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Oxyura jamaicensis</i>	Ruddy Duck
<i>Bonasa umbellus</i>	Ruffed Grouse
<i>Selasphorus rufus**</i>	Rufous Hummingbird
<i>Xema sabini</i>	Sabine's Gull
<i>Grus canadensis</i>	Sandhill Crane
<i>Passerculus sandwichensis</i>	Savannah Sparrow
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher
<i>Charadrius semipalmatus</i>	Semipalmated Plover
<i>Accipiter striatus</i>	Sharp-shinned Hawk
<i>Tympanuchus phasianellus*</i>	Sharp-tailed Grouse

SCIENTIFIC NAME	COMMON NAME
<i>Asio flammeus</i> **	Short-eared Owl
<i>Plectrophenax nivalis</i>	Snow Bunting
<i>Chen caerulescens</i>	Snow Goose
<i>Bubo scandiacus</i>	Snowy Owl
<i>Vireo solitarius</i>	Solitary Vireo
<i>Melospiza melodia</i>	Song Sparrow
<i>Porzana carolina</i>	Sora
<i>Actitis macularius</i>	Spotted Sandpiper
<i>Pipilo maculatus</i>	Spotted Towhee
<i>Falcapennis canadensis</i>	Spruce Grouse
<i>Cyanocitta stelleri</i>	Steller's Jay
<i>Melanitta perspicillata</i>	Surf Scoter
<i>Buteo swainsoni</i> **	Swainson's Hawk
<i>Catharus ustulatus</i>	Swainson's Thrush
<i>Myadestes townsendi</i>	Townsend's Solitaire
<i>Dendroica townsendi</i>	Townsend's Warbler
<i>Tachycineta bicolor</i>	Tree Swallow
<i>Cygnus buccinator</i> *	Trumpeter Swan
<i>Cygnus columbianus</i>	Tundra Swan
<i>Cathartes aura</i>	Turkey Vulture
<i>Ixoreus naevius</i>	Varied Thrush
<i>Chaetura vauxi</i>	Vaux's Swift
<i>Catharus fuscescens</i> *	Veery
<i>Poocetes gramineus</i>	Vesper Sparrow
<i>Tachycineta thalassina</i>	Violet-green Swallow
<i>Rallus limicola</i>	Virginia Rail
<i>Vireo gilvus</i>	Warbling Vireo
<i>Sialia mexicana</i>	Western Bluebird
<i>Aechmophorus occidentalis</i>	Western Grebe
<i>Sturnella neglecta</i>	Western Meadowlark
<i>Piranga ludoviciana</i>	Western Tanager
<i>Contopus sordidulus</i>	Western Wood-Pewee
<i>Sitta carolinensis</i>	White-breasted Nuthatch
<i>Zonotrichia leucophrys</i>	White-crowned Sparrow
<i>Plegadis chihi</i> *	White-faced Ibis
<i>Zonotrichia albicollis</i>	White-throated Sparrow
<i>Loxia leucoptera</i>	White-winged Crossbill
<i>Melanitta fusca</i>	White-winged Scoter
<i>Meleagris gallopavo</i> ***	Wild Turkey
<i>Tringa semipalmata</i>	Willet
<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker
<i>Empidonax traillii</i>	Willow Flycatcher
<i>Phalaropus tricolor</i>	Wilson's Phalarope

SCIENTIFIC NAME	COMMON NAME
<i>Gallinago delicata</i>	Wilson's Snipe
<i>Wilsonia pusilla</i>	Wilson's Warbler
<i>Troglodytes troglodytes</i> *	Winter Wren
<i>Aix sponsa</i>	Wood Duck
<i>Dendroica petechia</i>	Yellow Warbler
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird
<i>Dendroica coronata</i>	Yellow-rumped Warbler

REPTILES

SCIENTIFIC NAME	COMMON NAME
<i>Thamnophis sirtalis</i>	Common Gartersnake
<i>Coluber constrictor</i>	Eastern Racer
<i>Elgaria coerulea</i> *	Northern Alligator Lizard
<i>Chrysemys picta</i>	Painted Turtle
<i>Charina bottae</i>	Rubber Boa
<i>Thamnophis elegans</i>	Terrestrial Gartersnake

AMPHIBIANS

SCIENTIFIC NAME	COMMON NAME
<i>Rana luteiventris</i>	Columbia Spotted Frog
<i>Ambystoma macrodactylum</i>	Long-toed Salamander
<i>Pseudacris regilla</i>	Pacific Treefrog
<i>Ascaphus montanus</i>	Rocky Mountain Tailed Frog
<i>Bufo boreas</i> *	Western Toad

FISH

SCIENTIFIC NAME	COMMON NAME
<i>Cottus cognatus</i>	Slimy Sculpin
<i>Oncorhynchus clarkii lewisi</i> *	Westslope Cutthroat Trout

INVERTEBRATES

SCIENTIFIC NAME	COMMON NAME
<i>Rhyacophila betteni</i>	A Caddisfly
<i>Parapsyche elsis</i>	A Caddisfly
<i>Lepidostoma cascadense</i>	A Caddisfly
<i>Lepidostoma unicolor</i>	A Caddisfly
<i>Chyrandra centralis</i>	A Caddisfly
<i>Dicosmoecus atripes</i>	A Caddisfly
<i>Dicosmoecus gilvipes</i>	A Caddisfly
<i>Anagapetus debilis</i>	A Caddisfly
<i>Arctopsyche grandis</i>	A Caddisfly

SCIENTIFIC NAME	COMMON NAME
<i>Neophylax splendens</i>	A Caddisfly
<i>Neothremma alicia</i>	A Caddisfly
<i>Micrasema bactro</i>	A Caddisfly
<i>Helicopsyche borealis</i>	A Caddisfly
<i>Hesperophylax designatus</i>	A Caddisfly
<i>Onocosmoecus unicolor</i>	A Caddisfly
<i>Brachycentrus americanus</i>	A Caddisfly
<i>Brachycentrus occidentalis</i>	A Caddisfly
<i>Eukiefferiella brehmi</i>	A Eukiefferiellan Chironomid
<i>Eukiefferiella devonica</i>	A Eukiefferiellan Chironomid
<i>Eukiefferiella gracei</i>	A Eukiefferiellan Chironomid
<i>Ephydatia cooperensis*</i>	A Freshwater Sponge
<i>Helobdella stagnalis</i>	A Leech
<i>Nemotaulius hostilis</i>	A Limnephilid Caddisfly
<i>Serratella tibialis</i>	A Mayfly
<i>Ephemerella excrucians</i>	A Mayfly
<i>Baetis bicaudatus</i>	A Mayfly
<i>Baetis tricaudatus</i>	A Mayfly
<i>Epeorus longimanus</i>	A Mayfly
<i>Drunella coloradensis</i>	A Mayfly
<i>Drunella doddsi</i>	A Mayfly
<i>Drunella grandis</i>	A Mayfly
<i>Drunella spinifera</i>	A Mayfly
<i>Attenella margarita</i>	A Mayfly
<i>Acentrella turbida</i>	A Mayfly
<i>Timpanoga hecuba</i>	A Mayfly
<i>Plauditus punctiventris</i>	A Mayfly
<i>Caudatella hystrix</i>	A Mayfly
<i>Ergodesmus compactus</i>	A Millipede
<i>Lophomus laxus*</i>	A Millipede
<i>Endopus parvipes*</i>	A Millipede
<i>Rhyacophila brunnea</i>	A Rhyacophilan Caddisfly
<i>Rhyacophila alberta</i>	A Rhyacophilan Caddisfly
<i>Rhyacophila narvae</i>	A Rhyacophilan Caddisfly
<i>Rhyacophila verrula</i>	A Rhyacophilan Caddisfly
<i>Zaitzevia parvula</i>	A Riffle Beetle
<i>Heterlimnius corpulentus</i>	A Riffle Beetle
<i>Cleptelmis addenda</i>	A Riffle Beetle
<i>Lara avara</i>	A Riffle Beetle
<i>Narpus concolor</i>	A Riffle Beetle
<i>Ordobrevia nubifera</i>	A Riffle Beetle
<i>Despaxia augusta</i>	A Stonefly

SCIENTIFIC NAME	COMMON NAME
<i>Amphinemura banksi</i>	A Stonefly
<i>Prostoia besametsa</i>	A Stonefly
<i>Zapada cinctipes</i>	A Stonefly
<i>Zapada columbiana</i>	A Stonefly
<i>Zapada oregonensis</i>	A Stonefly
<i>Yoraperla brevis</i>	A Stonefly
<i>Doroneuria theodora</i>	A Stonefly
<i>Hesperoperla pacifica</i>	A Stonefly
<i>Claassenia sabulosa</i>	A Stonefly
<i>Setvena bradleyi</i>	A Stonefly
<i>Kogotus modestus</i>	A Stonefly
<i>Atherix pachypus</i>	A True Fly
<i>Tvetenia bavarica</i>	A Tvetenian Chironomid
<i>Cordulia shurtleffii</i>	American Emerald
<i>Pteronarcys dorsata</i>	American Salmonfly
<i>Agapetus montanus**</i>	An Agapetus Caddisfly
<i>Hyaletta azteca***</i>	An Amphipod
<i>Euphydryas anicia</i>	Anicia Checkerspot
<i>Papilio zelicaon</i>	Anise Swallowtail
<i>Sympetrum semicinctum</i>	Band-winged Meadowhawk
<i>Leucorrhinia proxima</i>	Belted Whiteface
<i>Sympetrum danae</i>	Black Meadowhawk
<i>Rhionaeschna multicolor**</i>	Blue-eyed Darner
<i>Leucorrhinia borealis*</i>	Boreal Whiteface
<i>Euconulus fulvus</i>	Brown Hive
<i>Rhionaeschna californica**</i>	California Darner
<i>Nymphalis californica</i>	California Tortoiseshell
<i>Speyeria callippe</i>	Callippe Fritillary
<i>Aeshna canadensis</i>	Canada Darner
<i>Ladona julia**</i>	Chalk-fronted Corporal
<i>Pontia protodice</i>	Checkered White
<i>Sympetrum internum</i>	Cherry-faced Meadowhawk
<i>Anax junius</i>	Common Green Darner
<i>Plathemis lydia</i>	Common Whitetail
<i>Leucorrhinia glacialis**</i>	Crimson-ringed Whiteface
<i>Lacinipolia cuneata</i>	Cuneate Arches
<i>Leucorrhinia intacta</i>	Dot-tailed Whiteface
<i>Libellula forensis</i>	Eight-spotted Skimmer
<i>Lestes dryas</i>	Emerald Spreadwing
<i>Discus whitneyi</i>	Forest Disc
<i>Libellula quadrimaculata</i>	Four-spotted Skimmer
<i>Euphydryas gillettii*</i>	Gillette's Checkerspot
<i>Polygona faunus</i>	Green Comma

SCIENTIFIC NAME	COMMON NAME
<i>Sphaerium simile</i>	Grooved Fingernailclam
<i>Sphaerium occidentale</i>	Herrington Fingernailclam
<i>Leucorrhinia hudsonica</i>	Hudsonian Whiteface
<i>Allogona ptychophora</i>	Idaho Forestsnail
<i>Oreohelix carinifera</i> *	Keeled Mountainsnail
<i>Aeshna eremita</i> **	Lake Darner
<i>Aeshna constricta</i> **	Lance-tipped Darner
<i>Lycaena cupreus</i>	Lustrous Copper
<i>Udosarx lyrata</i> *	Lyre Mantleslug
<i>Magnipelta mycophaga</i> *	Magnum Mantleslug
<i>Deroceras laeve</i> ***	Meadow Slug
<i>Aglais milberti</i>	Milbert's Tortoiseshell
<i>Somatochlora semicircularis</i> **	Mountain Emerald
<i>Enallagma annexum</i>	Northern Bluet
<i>Chlosyne palla</i>	Northern Checkerspot
<i>Lestes disjunctus</i>	Northern Spreadwing
<i>Ischnura cervula</i>	Pacific Forktail
<i>Cordulegaster dorsalis</i>	Pacific Spiketail
<i>Aeshna palmata</i>	Paddle-tailed Darner
<i>Ophiogomphus severus</i>	Pale Snaketail
<i>Papilio eurymedon</i>	Pale Swallowtail
<i>Gnophaela vermiculata</i>	Police Car Moth
<i>Zonitoides arboreus</i>	Quick Gloss
<i>Sympetrum madidum</i> **	Red-veined Meadowhawk
<i>Dasyfidonia avuncularia</i>	Red-winged Wave
<i>Calopteryx aequabilis</i>	River Jewelwing
<i>Colligyus greggi</i> *	Rocky Mountain Dusksnail
<i>Oreohelix strigosa</i>	Rocky Mountainsnail
<i>Sympetrum costiferum</i>	Saffron-winged Meadowhawk
<i>Pteronarcys californica</i>	Salmonfly
<i>Polites sabuleti</i>	Sandhill Skipper
<i>Aeshna juncea</i> **	Sedge Darner
<i>Aeshna umbrosa</i>	Shadow Darner
<i>Pacifastacus leniusculus</i>	Signal Crayfish
<i>Prophyaon humile</i> *	Smoky Taildropper
<i>Epitheca spinigera</i> **	Spiny Baskettail
<i>Lestes congener</i>	Spotted Spreadwing
<i>Microphysula ingersolli</i>	Spruce Snail
<i>Hyles euphorbiae</i> ***	Spurge Hawkmoth
<i>Sympetrum pallipes</i>	Striped Meadowhawk
<i>Oreohelix subrudis</i>	Subalpine Mountainsnail
<i>Coenagrion resolutum</i>	Taiga Bluet
<i>Libellula pulchella</i>	Twelve-spotted Skimmer

SCIENTIFIC NAME	COMMON NAME
<i>Helisoma anceps</i>	Two-ridge Rams-horn
<i>Aeshna interrupta</i>	Variable Darner
<i>Sympetrum corruptum</i>	Variiegated Meadowhawk
<i>Vittrina pellucida</i>	Western Glass-snail
<i>Margaritifera falcata</i> *	Western Pearlshell
<i>Amphiagrion abbreviatum</i>	Western Red Damsel
<i>Cupido (Everes) amyntula</i>	Western Tailed Blue
<i>Sympetrum obtrusum</i>	White-faced Meadowhawk
<i>Stagnicola caperata</i>	Wrinkled Marshsnail
<i>Aeshna sitchensis</i> **	Zigzag Darner

VASCULAR PLANTS

SCIENTIFIC NAME	COMMON NAME
<i>Polygonum austiniiae</i> *	Austin's Knotweed
<i>Bidens beckii</i> *	Beck Water-marigold
<i>Potamogeton obtusifolius</i> *	Blunt-leaved Pondweed
<i>Centunculus minimus</i> *	Chaffweed
<i>Cardamine rupicola</i> *	Cliff Toothwort
<i>Carex crawei</i> *	Crawe's Sedge
<i>Carex chordorrhiza</i> *	Creeping Sedge
<i>Castilleja cervina</i> *	Deer Indian Paintbrush
<i>Drosera anglica</i> *	English Sundew
<i>Collomia debilis var. camporum</i> *	Flexible Collomia
<i>Juncus hallii</i> *	Hall's Rush
<i>Grindelia howellii</i> *	Howell's Gumweed
<i>Hutchinsia procumbens</i> *	Hutchinsia
<i>Physaria carinata</i> *	Keeled Bladderpod
<i>Drosera linearis</i> *	Linear-leaved Sundew
<i>Botrychium minganense</i> **	Mingan Island Moonwort
<i>Phlox kelseyi var. missoulensis</i> *	Missoula Phlox
<i>Carex livida</i> **	Pale Sedge
<i>Nymphaea leibergii</i> *	Pygmy Water-lily
<i>Eriophorum gracile</i> *	Slender Cottongrass
<i>Schoenoplectus subterminalis</i> *	Water Bulrush
<i>Brasenia schreberi</i> *	Watershield

* *Species of Concern*

** *Potential Species of Concern*

*** *Exotic Species (not native to Montana)*

Appendix C

List of Endangered and Threatened Species

MAMMALS

SCIENTIFIC NAME	COMMON NAME
<i>Lynx canadensis</i> (T)	Canada lynx
<i>Canis lupus</i> (E)	Gray wolf
<i>Ursus arctos horribilis</i> (T)	Grizzly bear

FISH

SCIENTIFIC NAME	COMMON NAME
<i>Salvelinus confluentus</i> (T)	Bull trout

PLANTS

SCIENTIFIC NAME	COMMON NAME
<i>Howellia aquatilis</i> (T)	Water howellia

(E) Endangered—listed in the Federal Register as being in danger of extinction

(T) Threatened—listed in the Federal Register as likely to become endangered within the foreseeable future

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